

Five new peacock spiders from eastern Australia (Araneae: Salticidae: Euophryini: *Maratus* Karsch 1878 and *Saratus*, new genus)

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Abstract: Four new jumping spiders of the genus *Maratus* are described from eastern Australia, related to the recently described *M. julianneae* and also placed in a group of grassland peacock spiders within the *anomalus* group of that genus: *M. aurantius*, *M. cinereus*, *M. lentus*, and *M. neptunus*. A new genus and species of peacock spider, *Saratus hesperus*, is also described from this region.

Key words: euophryine, jumping spider, *Maratus anomalus*, *Maratus aurantius*, *Maratus julianneae*, *Maratus cinereus*, *Maratus kochi*, *Maratus lentus*, *Maratus neptunus*, *Saratus hesperus*.

Grassland species within the *anomalus* group of *Maratus*

Here we describe four new species within the *anomalus* group (Otto & Hill 2016b; Baehr & Whyte 2016) of the genus *Maratus* Karsch 1878. Like the related *Maratus julianneae* Baehr & Whyte 2016 these new species are known from grassland habitats in eastern Australia (Figures 1-3), and we refer to all five species as *grassland peacock spiders*.

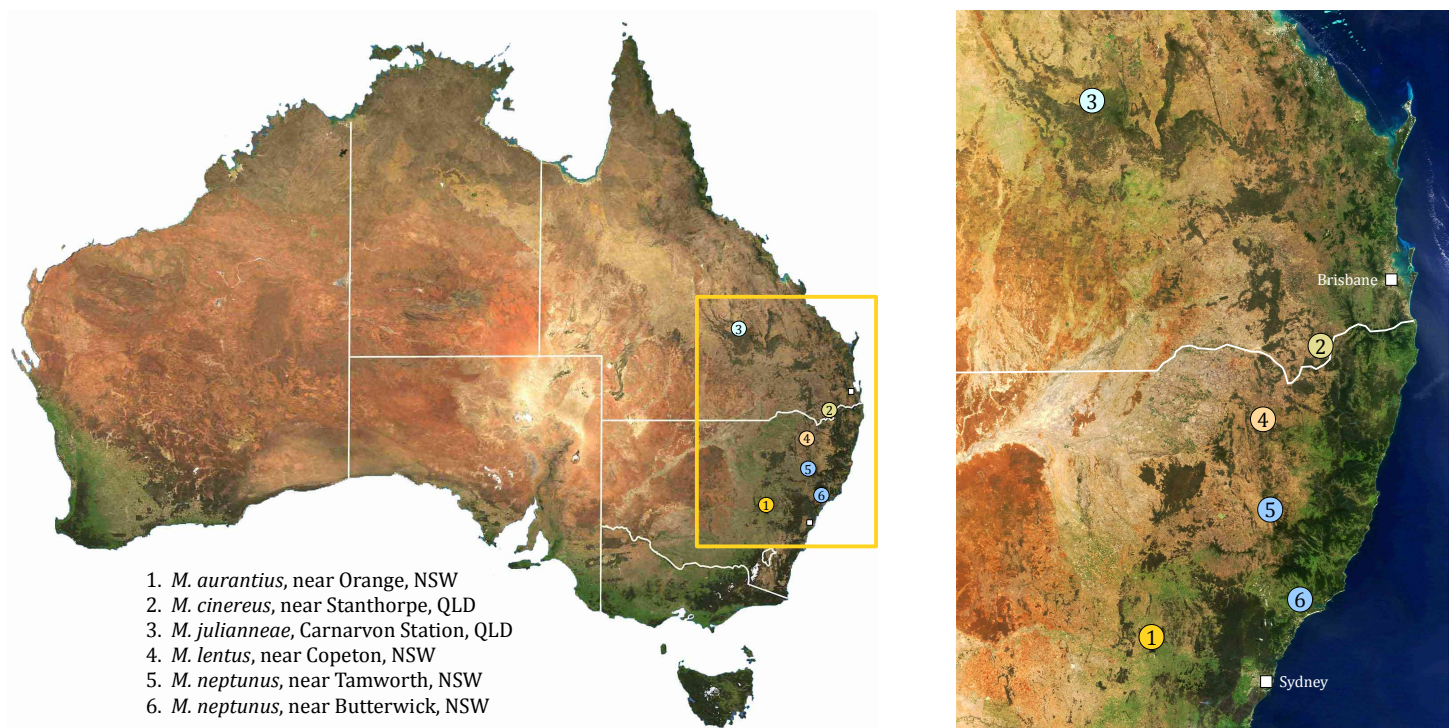


Figure 1. Eastern Australian localities associated with the five known species of grassland peacock spiders. Except for the recently described *M. julianneae*, all of these are new. Maps based on NASA Visible Earth imaging.

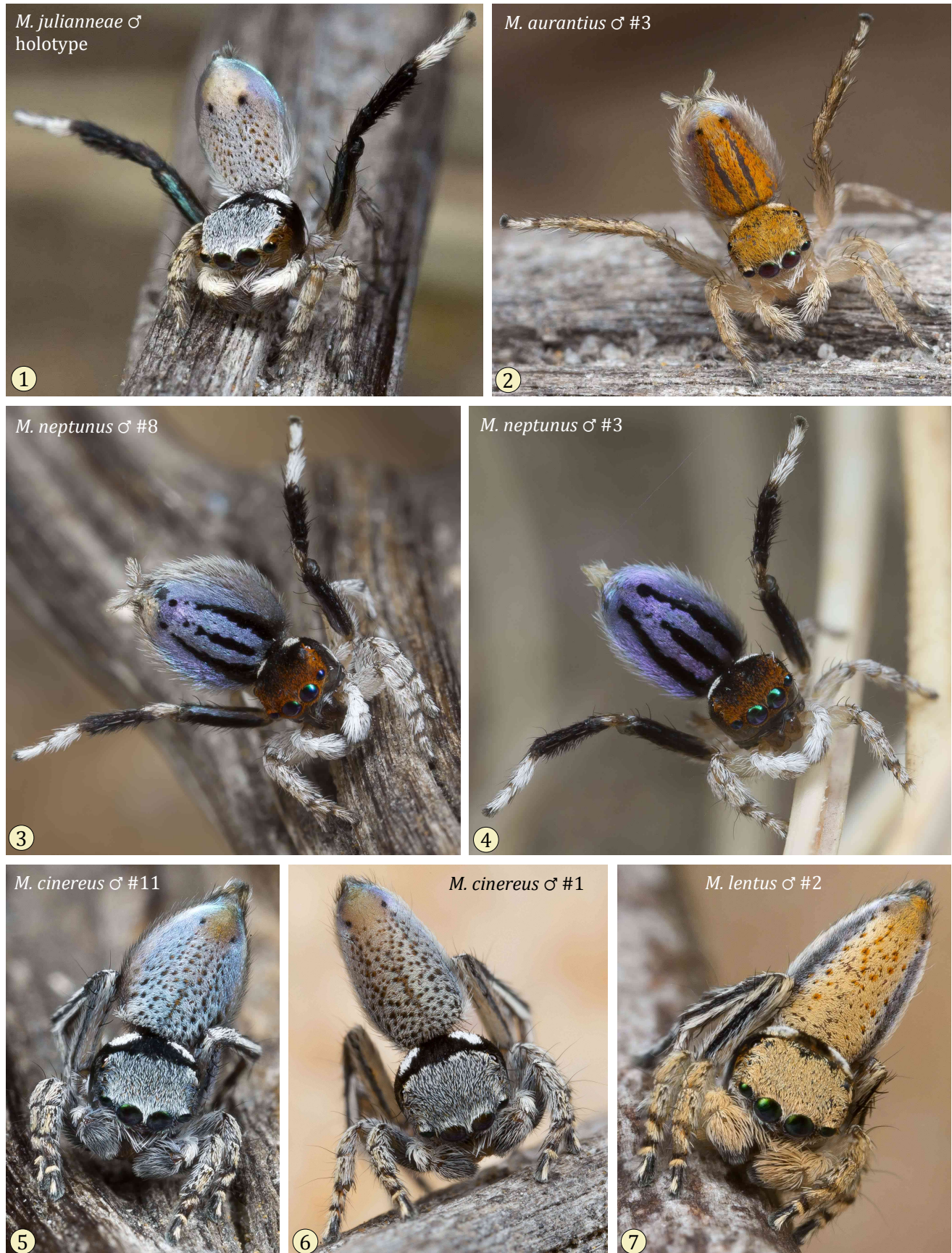


Figure 2. Courtship display by males of the five known grassland peacock spiders. 1, *M. julianneae* was recently described from Carnarvon Station. 2-7, Four new species described here are *M. aurantius* (2), *M. neptunus* (3-4), *M. cinereus* (5-6) and *M. lentus* (7).



Figure 3. Adult females of the four new grassland peacock spider species. Females within this group are very similar with respect to size and colouration and can be difficult to identify. **1-4,** The female *M. aurantius*, like the male, has a narrow light brown stripe running along either side of the midline of the opisthosoma. These are less distinct than in the male and variable with respect to their colour and definition. These stripes can also be found, generally with less definition, in some female *M. cinereus* (7), or *M. lentus* (9). **5-12,** Female *M. cinereus* (5-8) and *M. lentus* (9-12) have similar scale patterns on the dorsal opisthosoma. *M. lentus* females may have more distinct chevrons along the midline of the opisthosoma, but some *M. cinereus* females (8) also have these. **13-16,** Like the male, the female *M. neptunus* has one median and two lateral dark stripes along the length of the dorsal opisthosoma, all well-defined.

The genitalia of males of all five species differ little from those of *Maratus anomalus* (Karsch 1878), recently described with SEM images (Baehr & Whyte 2016), and they also share with that species a uniformly coloured eye region with no stripes, a pair of lateral white bands on the carapace behind the eye region and a pair of small black spots toward the rear of the dorsal opisthosoma. The grassland group

however shares additional characters not present in *M. anomalus*, including lateral opisthosomal fringes, fringed spinnerets of moderate length that may be extended and waved during courtship display (Figure 2), a relatively long and pointed opisthosoma, and lack of the triangular patch of white colular setae found in almost all other *Maratus* species. The scale pattern of the dorsal opisthosoma (fan) of *M. julianneae* resembles that of *M. cinereus* and *M. lentus*, although the posterior black spots are larger and more anterior in *M. julianneae*.

We consider *M. cinereus* and *M. lentus* to be closely related or sister species. Setation or scale patterns of both species are very similar, although colouration of the males that we have observed is different, and we have also observed differences in male courtship display. The male *M. lentus* has a prominent dark grey stripe along each lateral margin of the fan, and this is lacking in *M. cinereus*. Both species have small but distinctive "cuffs" of longer setae around the proximal tarsus of each leg I and II, and prominent black and white stripes along the length of each leg III. The courtship display of these two species also differs from that of the other three. It is based on elevation and lateral movement of the fan with periodic extension or kicking of legs III, whereas in the display of *M. aurantius*, *M. julianneae* and *M. neptunus*, like that of *M. anomalus*, legs III are generally extended and elevated as the spider steps from side to side (Figure 2: 1-4). Male *M. cinereus* and *M. lentus* may also move one pedipalp to the side to expose the front (paturon) of the respective chelicera during display. A more detailed description of display behaviour will be included with the description of each species.

The female of *M. julianneae* has not been described but can be expected to resemble the females of the other grassland peacock spiders. We have examined the female holotype for *Maratus kochi* (Žabka 1987) and this closely resembles other female grassland species with respect to colour pattern and epigynum. The type locality for *M. kochi* is Peak Downs, now a mining area northeast of Clermont, about 300 km northeast of the Carnarvon, QLD locality of *M. julianneae*. Females of the four new species in this group are very similar with respect to size and colouration (Figure 3). The most distinctive of these is *M. neptunus*, with three well-defined dark stripes on the opisthosoma. *M. aurantius* may have two relatively well-defined, light brown stripes on the opisthosoma. Female *M. cinereus* and *M. lentus* are very similar and intraspecific variation with respect to detailed scale patterns may be greater than interspecific differences.

***Maratus aurantius*, new species**

Type specimens. The holotype male (♂ #1), three paratype males (♂ #2-4), two paratype females (♀ #1, 3), and one paratype female (♀ #4) collected when immature and reared to adulthood, were collected near Orange, New South Wales (S33.25344°, E148.93661°, 25 OCT 2015, coll. M. Doe, M. Duncan, A. Fletcher). All types will be deposited in the Australian Museum, Sydney.

Etymology. The species group name (*aurantius*, Latin, m., adjective, English translation *orange*) refers to the bright orange colouration of the adult male.

Diagnosis. Male and female genitalia are similar to those of other members of the *anomalus* group (Otto & Hill 2016b). Females are cryptic brown and similar in colouration to other grassland peacock spiders, but have a relatively well-defined light brown stripe on either side of the midline of the opisthosoma (Figure 3). These are best identified by association with the distinctive males. The eye region of the male is covered with dull orange setae, and the dorsal opisthosoma is marked with a narrow, shiny or light blue stripe on either side of the midline leading back to a small black posterior spot, on a background of bright red-orange setae.

Description of male (Figures 4-8). Males are 3.8-4.2 mm in length (n=4). The chelicerae are light brown and translucent. Off-white setae extend diagonally from the brown, translucent clypeus toward the midline between the chelicerae. The eye region and the sides of the carapace just below the lateral eyes are covered with uniform dull orange to brown scales or setae. The sides of the carapace are light brown and translucent and may bear two narrow vertical stripes of off-white setae. There is no marginal band and the lateral rims of the carapace are clearly visible.

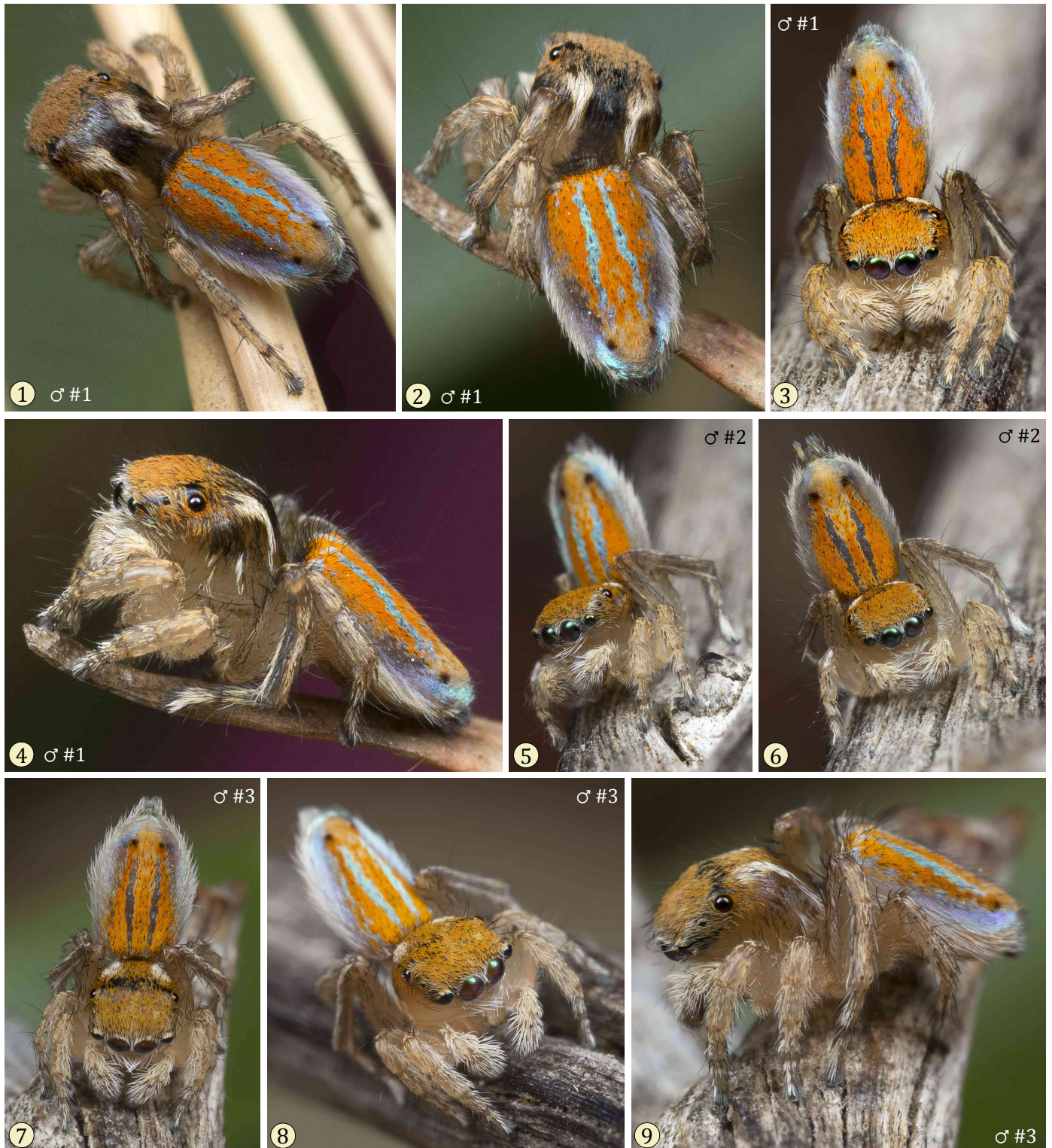


Figure 4. Views of the living holotype (1-4) and two paratype male *M. aurantius* (5-6, 7-9).



Figure 5. Views of two living paratype male *M. aurantius* (1-3, 4-7).



Figure 6. Two ventral views of the living holotype male *M. aurantius*.

Dull orange scales may extend toward the rear of the carapace behind the eye region, and a wide band of off-white scales extends behind each PLE, converging toward the rear where the two bands are separated by a wide, dark, mostly glabrous median stripe. The PME are slightly closer to the PLE than to the ALE.

The dorsal plate of the opisthosoma bears five relatively distinct longitudinal bands of colourful setae. The median band is comprised of bright red-orange pigmented scales, flanked on either side by a band of light green to blue to purple iridescent scales, in turn flanked by a lateral band of bright red-orange pigmented scales. In certain lighting conditions the iridescent bands appear as a pair of dark stripes on a red-orange field (Figure 5: 1). At the rear of the dorsal plate the background scales are uniform light brown or tan, with a small black spot on either side. Laterally the dorsal plate is fringed with white to off-white setae, and the sides of the opisthosoma have a dense cover of long, off-white setae. The spinnerets are black below (Figure 6), but fringed with off-white setae and they may be extended during courtship display (Figure 5: 1-2). The ventral opisthosoma is brown and mostly glabrous with scattered white to off-white setae, flanked on either side by a distinct black stripe. The sternum, labium, coxae, and endites are almost colourless and translucent with scattered white to off-white setae.

All legs are quite uniform in colouration, very light orange and translucent and bearing many off-white to very light orange scales and setae. Longer cuff-like setae may extend from each metatarsus and tarsus, but these "cuffs" are not as prominent or distinct in this species as they are in *M. cinereus* and *M. lentus*. As in other *Maratus*, legs I and II are shorter and of the same length, while legs III and IV are longer and legs III are the longest.

Each pedipalp is light brown and translucent, covered with long light brown or off-white setae in the front (Figures 4: 3, 5: 1). The detailed structure (Figure 8) is similar to that of other members of the *anomalus* group, with a prominent outer ring of the embolus terminating in a blunt or bifurcated apex, beneath which is a shorter pointed apex of a short inner ring. SEM images that show these structures in more detail have been published for other members of the *anomalus* group (Baehr & Whyte 2016). Although useful for association with the *anomalus* group, these structures are of little use for identification of species as they vary little within that group.

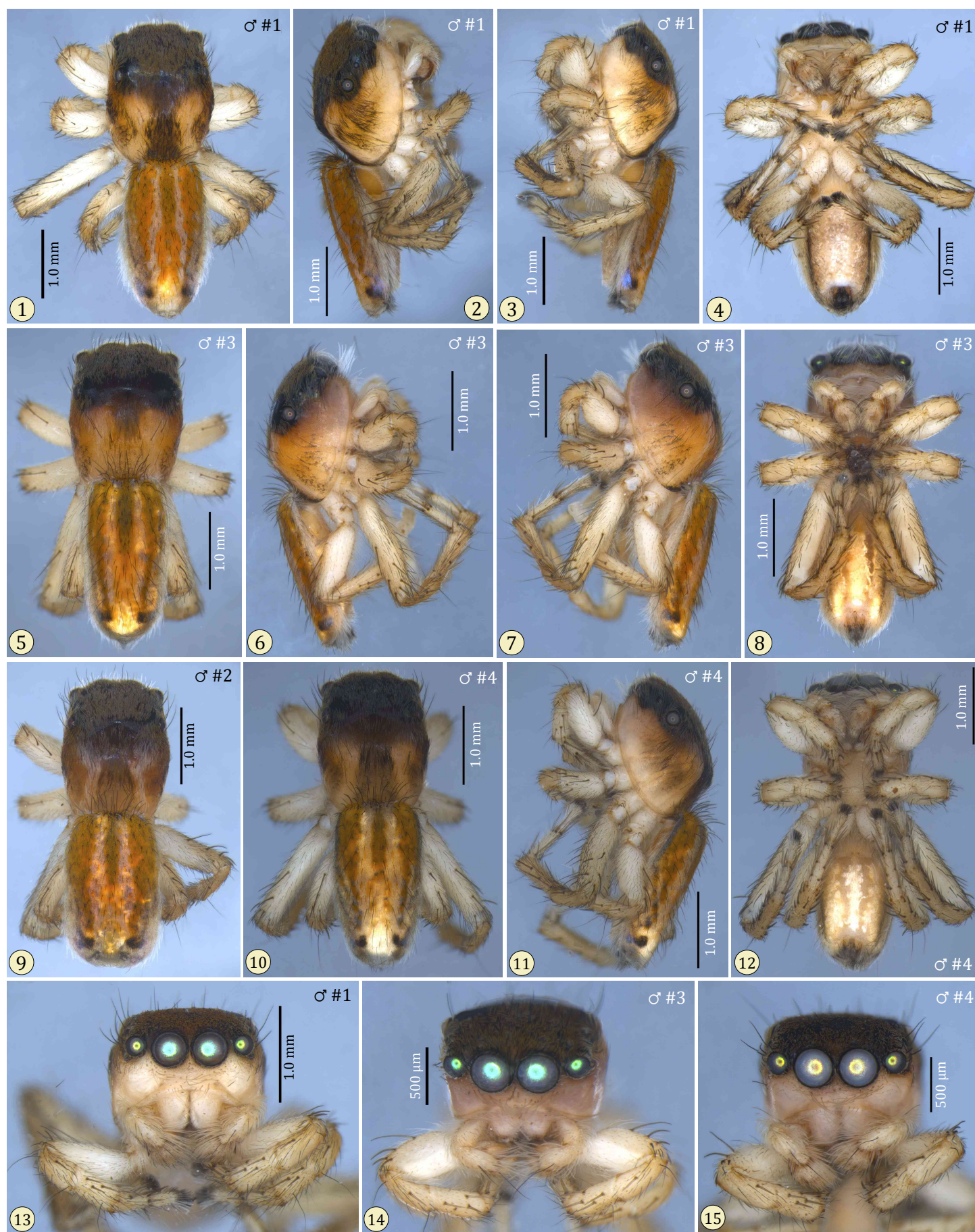


Figure 7. Holotype (1-4 & 13) and paratype (5-8 & 14, 9, 10-12 & 15) specimens of the male *M. aurantius*, in alcohol.

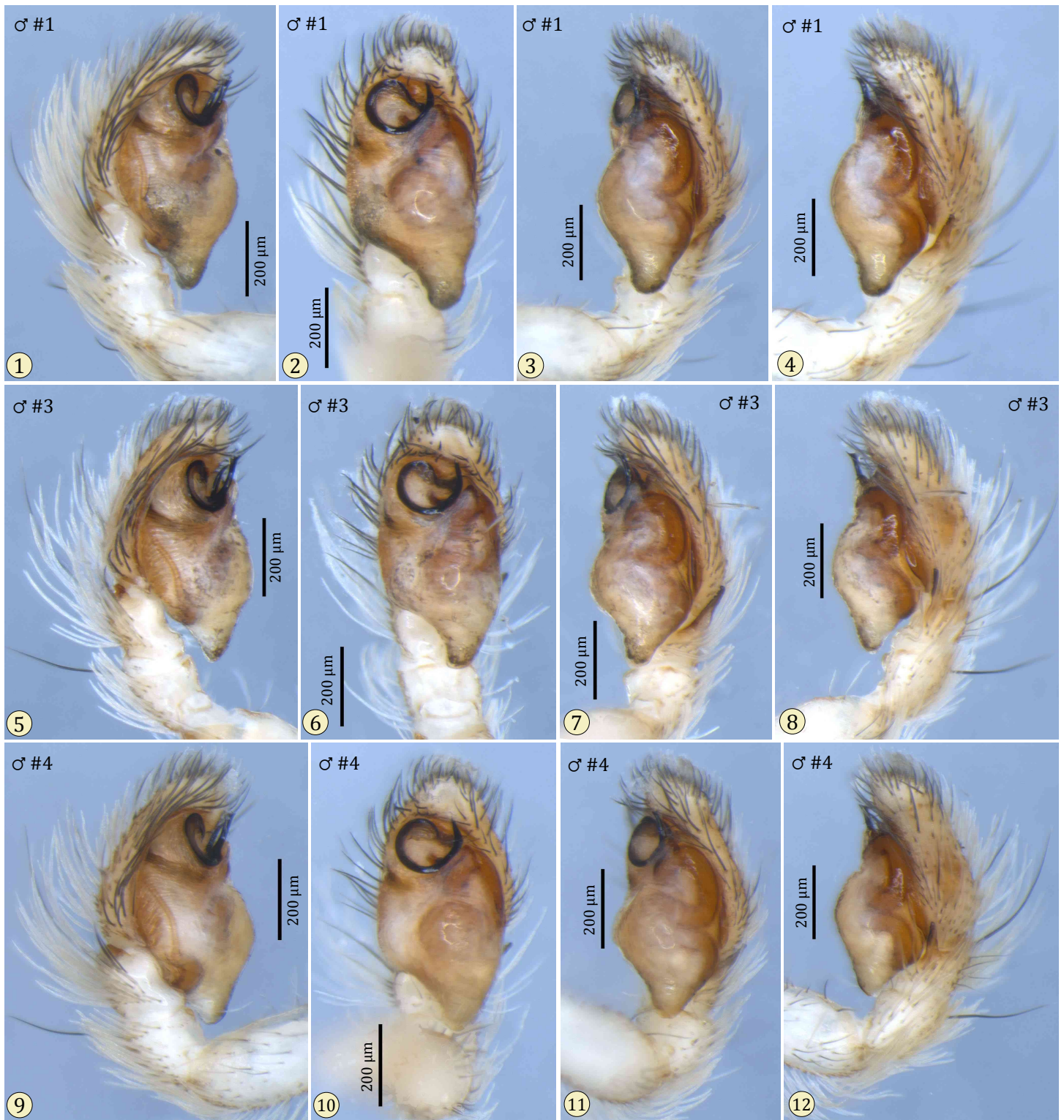


Figure 8. Medial to lateral views of the left pedipalp of the holotype (1-4) and two paratype (5-8, 9-12) male *M. aurantius*. The presence of an outer apex of the embolus with a blunt or bifurcated tip above a smaller, sharply pointed apex is characteristic of the *anomalus* group.

Description of female (Figures 9-13). Females range from 4.6-4.8 mm in length (n=3). The chelicerae, clypeus, and lower parts of the carapace are light brown, translucent, and glabrous. Longer white setae extend anteromedially below the front eye row. The carapace lacks a marginal band and the lateral rims are clearly visible. The eye region is covered with dull orange-brown setae. Behind the posterior eyes the dorsal carapace is mostly glabrous, with a wide dark, glabrous median stripe. On either side of this the

carapace is lighter brown and may be covered with off-white scales or setae (Figure 9: 7). The PME is about the same distance from the ALE as from the PLE. The dorsal opisthosoma is covered with an indistinctly striated or variegated pattern of mixed light to dark brown scales, with a light stripe on either side of the midline, flanked on the sides of the opisthosoma by a wide band of off-white scales and setae. The legs are uniform in colour, light brown and translucent with a covering of off-white setae above, primarily on legs III and IV. Legs I and II are shorter, legs III and IV longer, and legs III are the longest. The ventral opisthosoma is covered with shorter off-white setae and may be flanked on either side by a narrow black stripe (Figure 11: 1). The venter of the prosoma including the coxae is mostly light brown, glabrous, and translucent. The epigynum closely resembles that of other members of the *anomalus* group, with dark sclerotized ducts visible laterally and medially at the rear of each fossa (Figure 13).

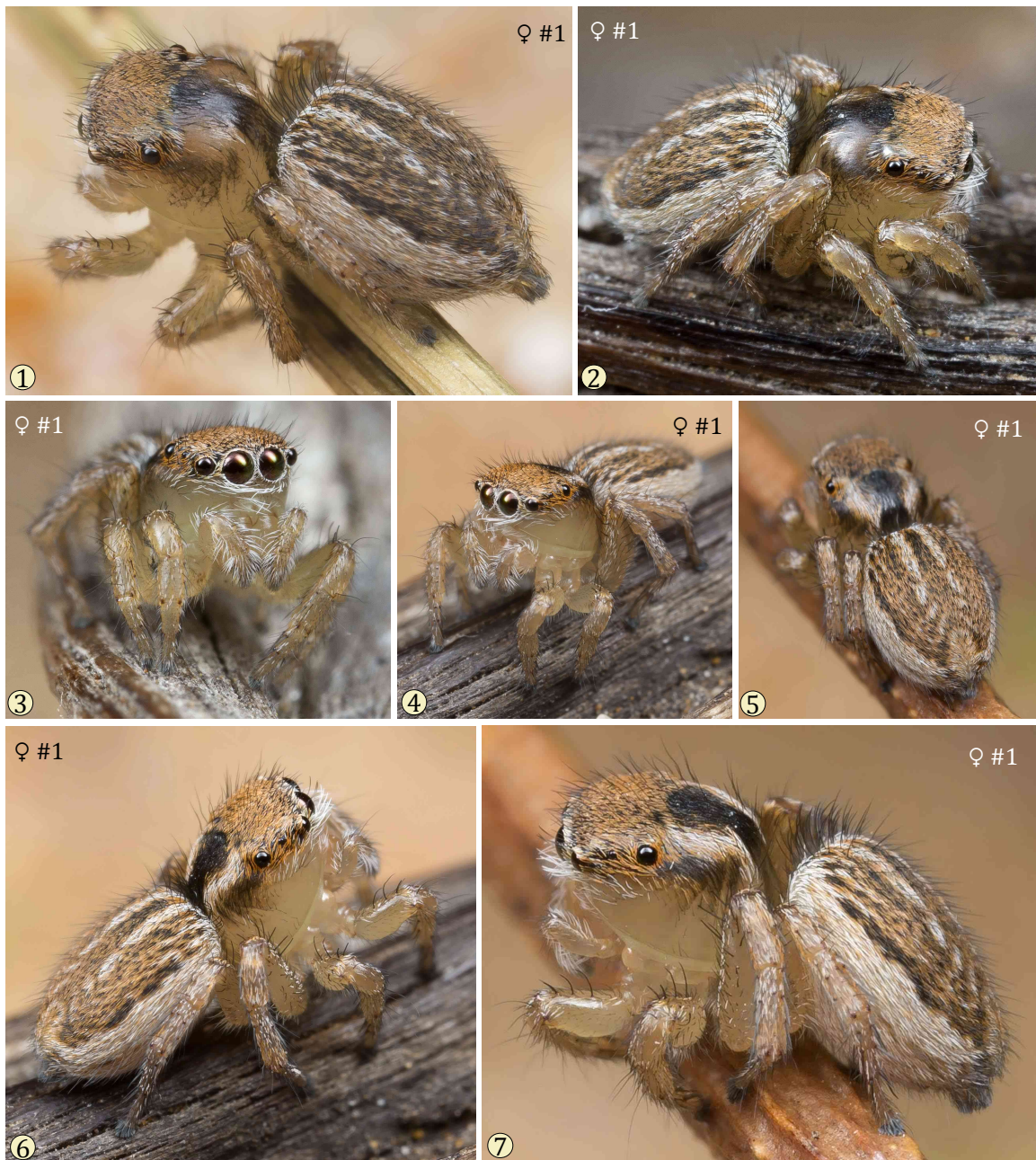


Figure 9. Views of a living female *Maratus aurantius*.



Figure 10. Three living female *Maratus aurantius* (1-3, 4, 5-8).

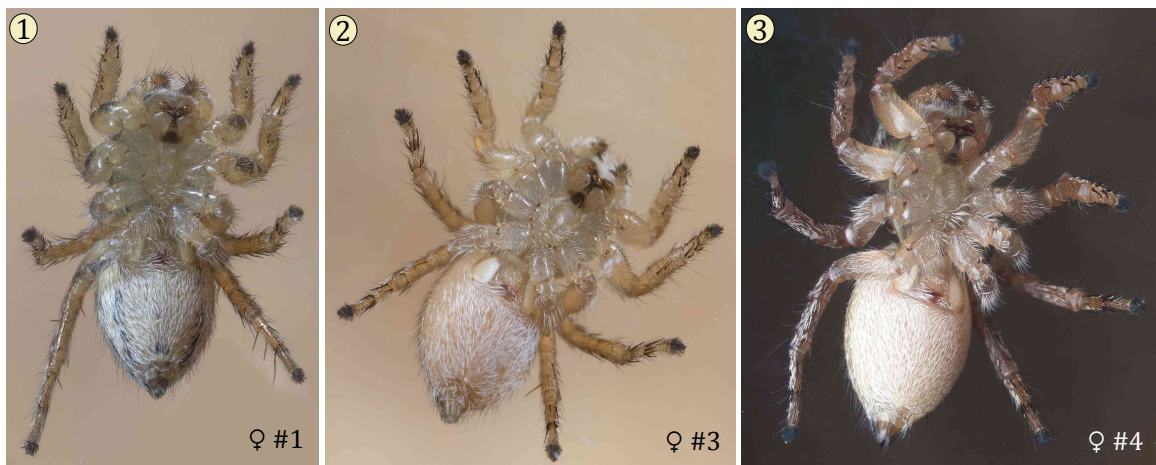


Figure 11. Ventral view of three living female *Maratus aurantius*. 1, This individual has dark, narrow lines on either side of the ventral opisthosoma, corresponding to those of the male.

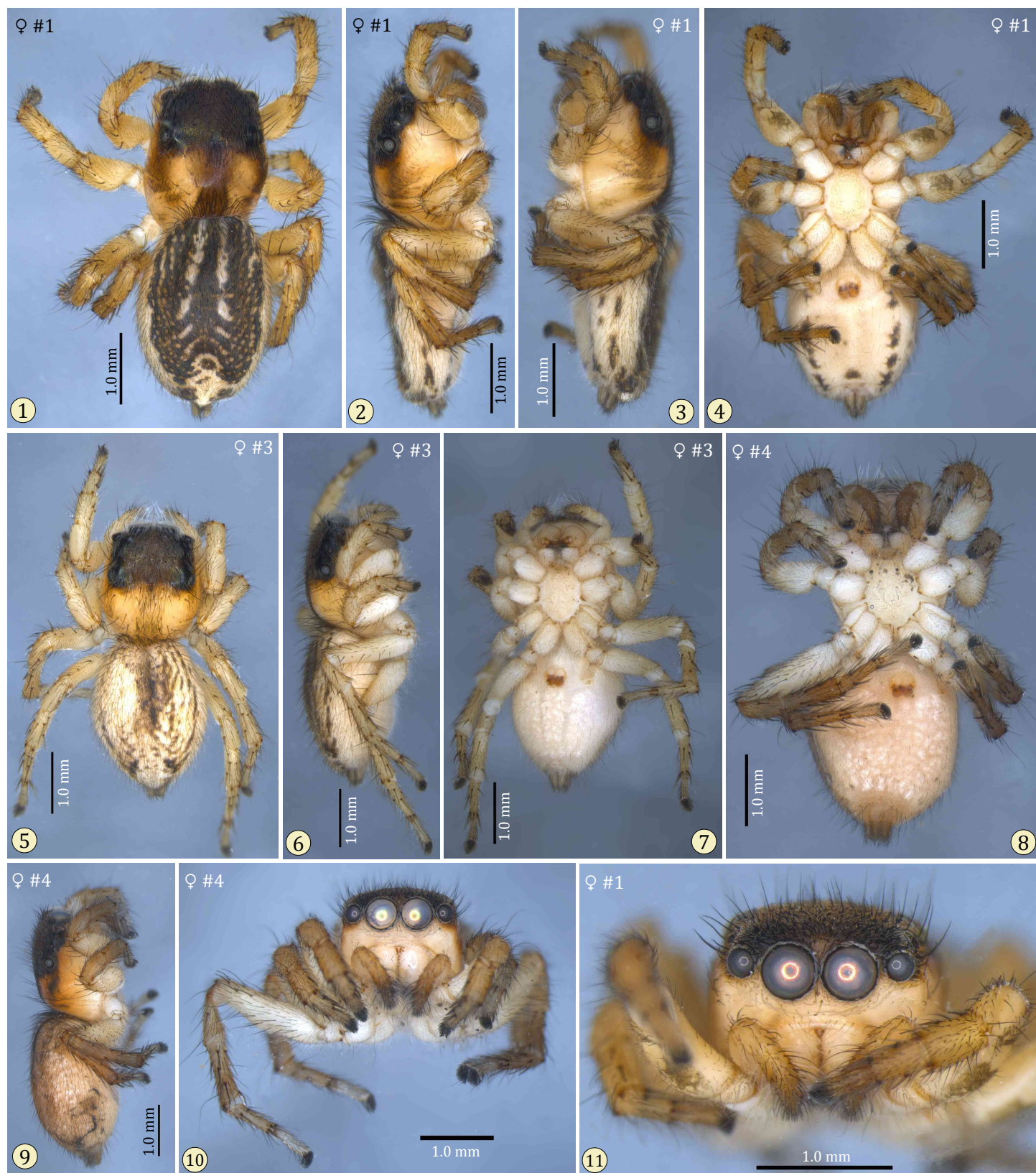


Figure 12. Views of three female *M. aurantius* fixed in alcohol.

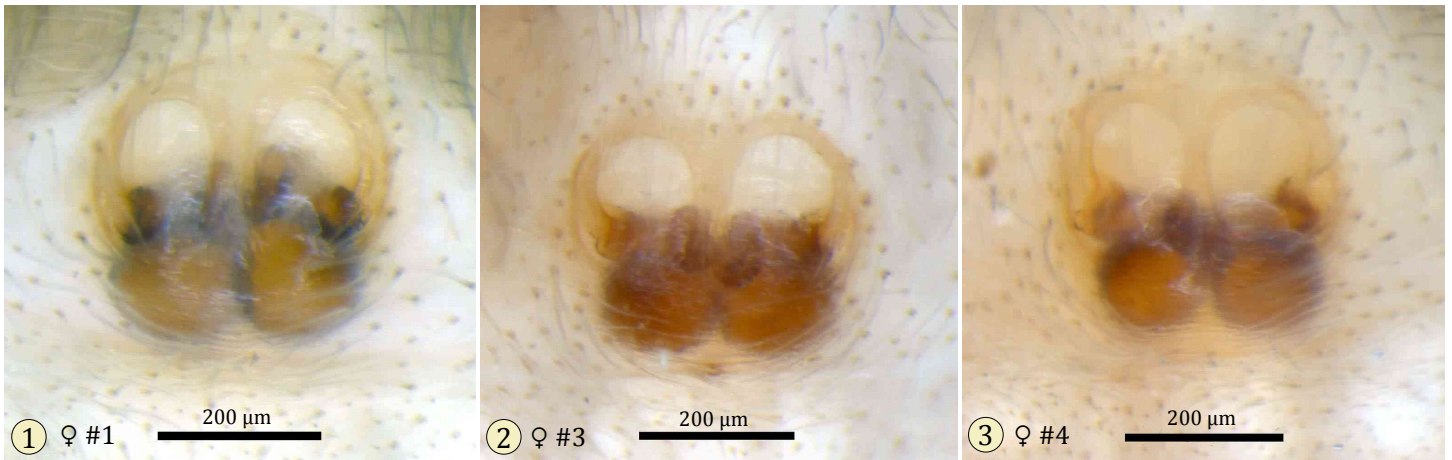


Figure 13. Ventral or external view of the epigynum of three female *Maratus aurantius*. The anterior direction is toward the top of each photograph. As in other members of the *anomalus* group, heavily sclerotized ducts may be seen at the rear of each fossa, on either side. Note variations in the relative size of the large posterior spermathecae and the width of the septum that separates the fossae.

Courtship display (Figures 14-17). The courtship display by male *Maratus aurantius* is relatively simple, with the flattened fan held in an erect position, usually with one or both legs III extended and elevated in a partly flexed position, as the male steps from side to side in front of a female. The spinnerets may also be extended and held apart, and the legs III may be slowly moved during this display.

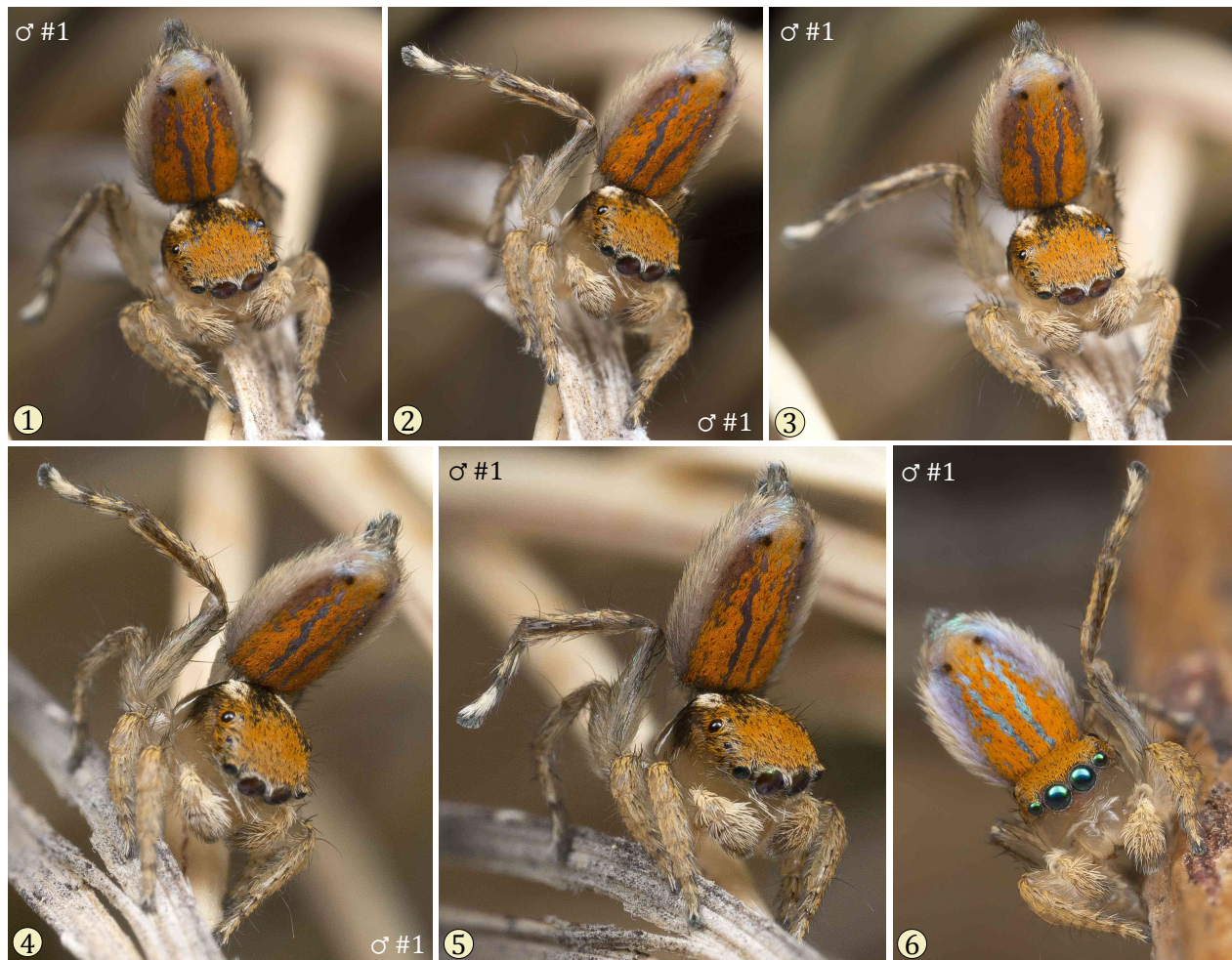


Figure 14. Display positions of the holotype male *M. aurantius*, showing elevation and flexion of a leg III.

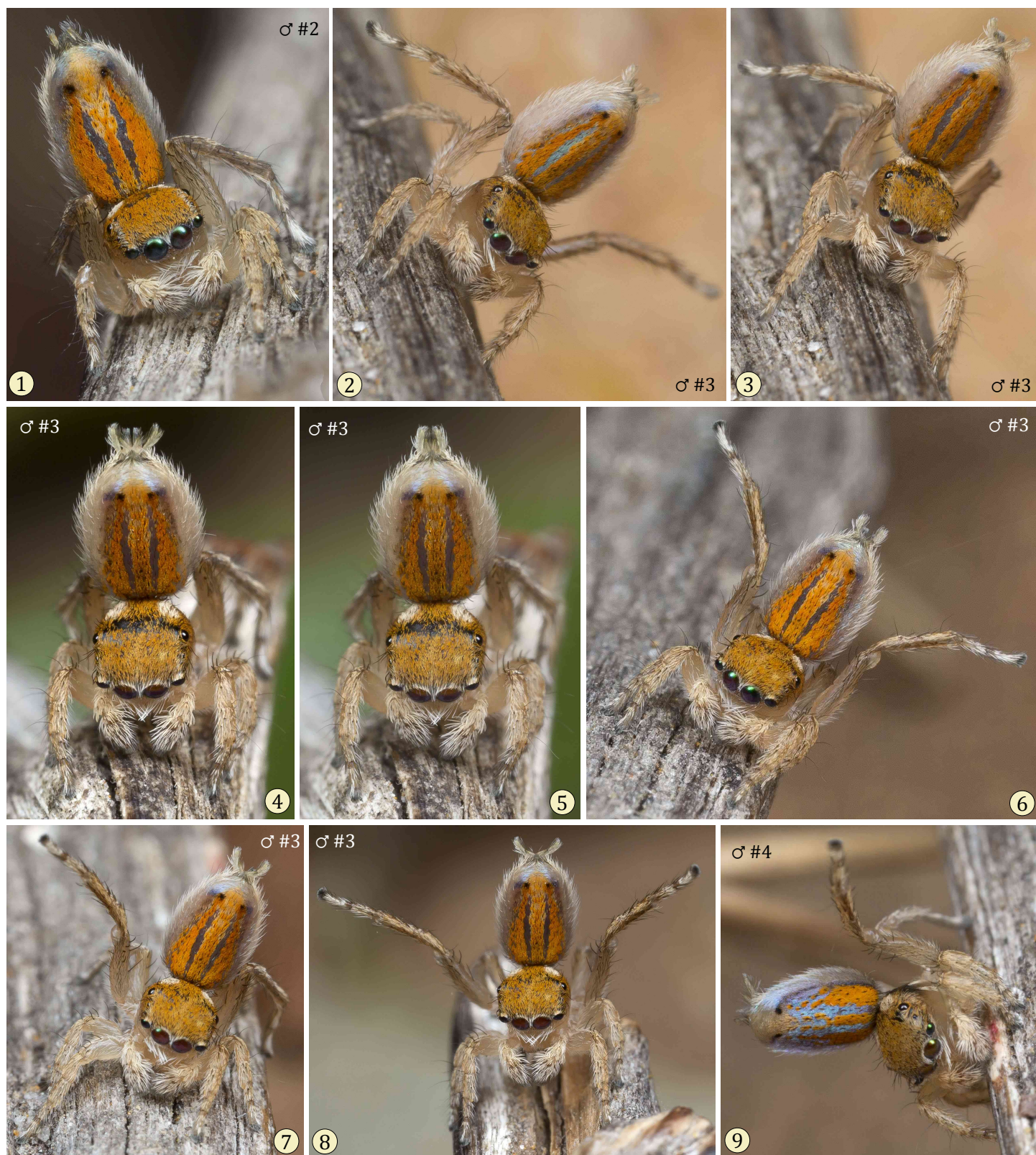


Figure 15. Display positions of three paratype male *M. aurantius* (1, 2-8, 9). 1-3, A male may display by simply raising the fan in front of a female, but as the action proceeds usually one or both legs III is extended and partially flexed. Movement of legs III is relatively slow and the fan itself is not waved as the male steps from side to side. 4-5, The extended spinnerets may be separated (4) or pulled together (3) during the display. 6-8, Often the posterior medial spinnerets are retracted to the rear during display.

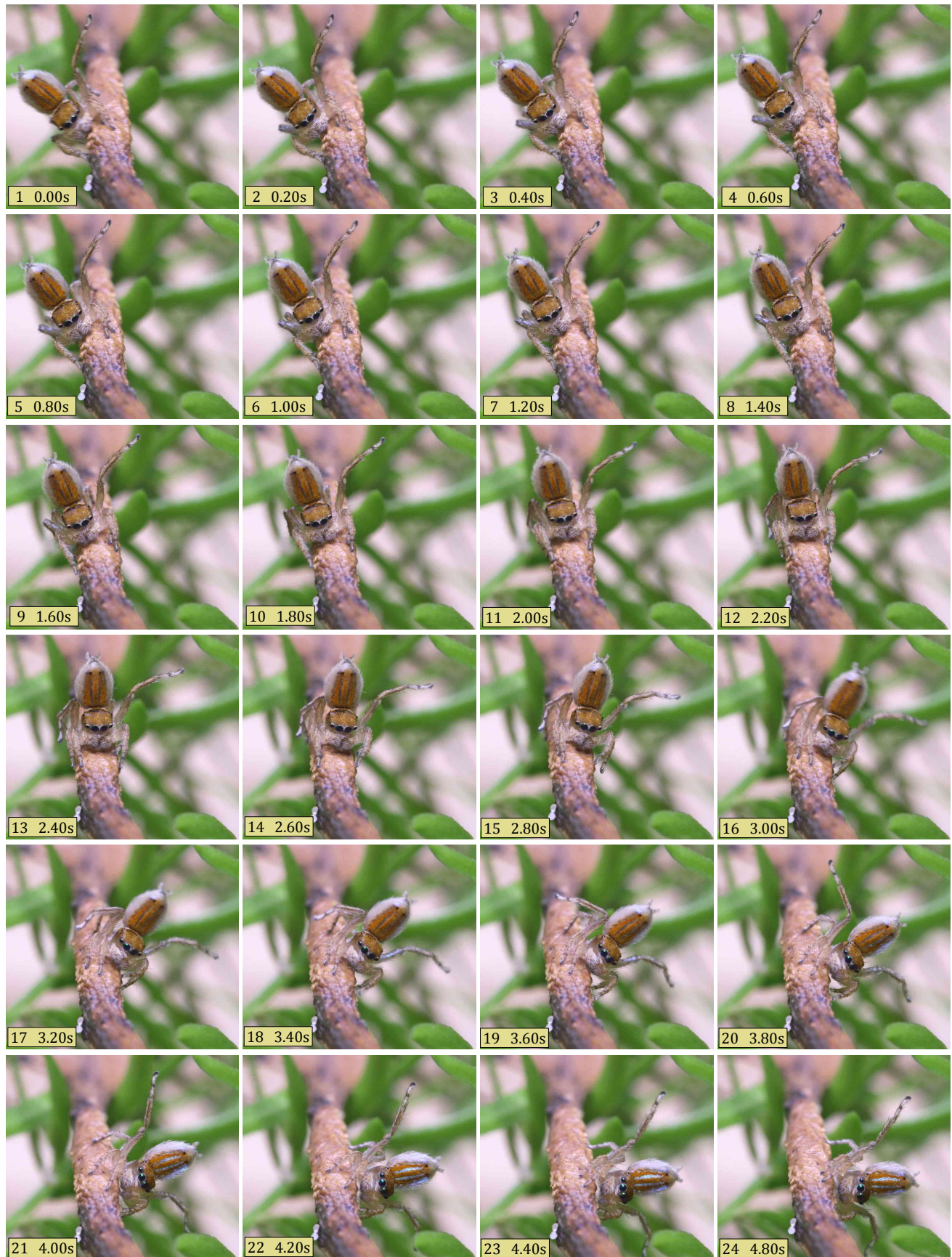


Figure 16. Sequence of frames (5fps, from 25fps video) showing the relatively slow movement of a male *M. aurantius* as he stepped around a branch while facing a female. Leg LIII was held in an extended position as leg RIII was slowly extended during this display. Note the extended spinnerets. The fan was not waved.

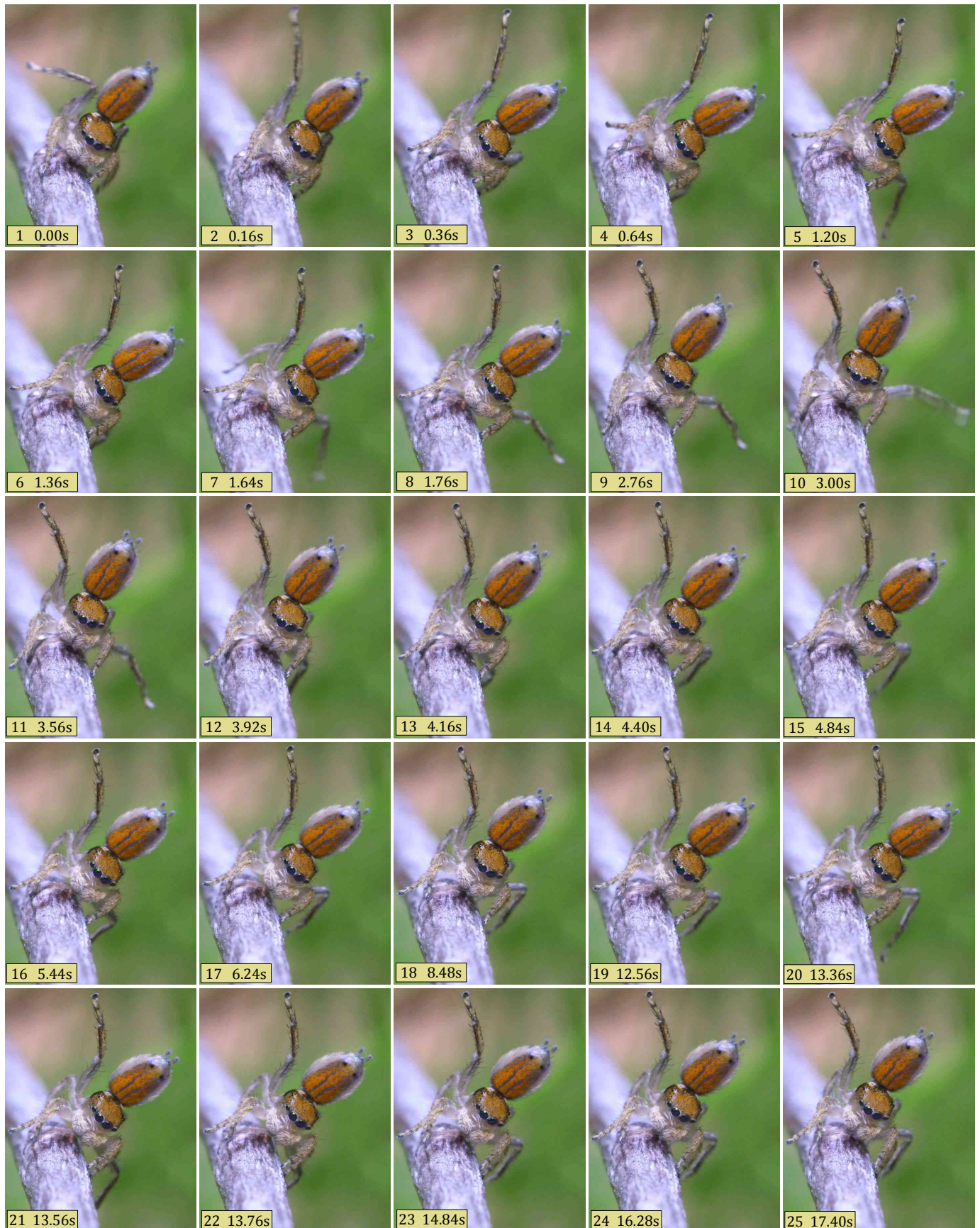


Figure 17. Sequential but not consecutive frames (from 25fps video) showing positions of a male *M. aurantius* moving slowly from side to side in front of a female. Leg RIII was held in an extended position as leg LIII was extended (7-10) and then flexed (11-12) in ~2s.

Habitat. The open woodland where *Maratus aurantius* was found on grasses near Orange, NSW, is shown in Figure 18.



Figure 18. Grassland habitat of *Maratus aurantius* near Orange, NSW. Photograph by Adam Fletcher.

***Maratus cinereus*, new species**

Type specimens. The holotype male (♂ #1), nine paratype males (♂ #2-10), one paratype male collected when penultimate and reared to maturity (♂ #11) and seven paratype females (♀ #1-7) were collected near Stanthorpe, Queensland (S28.75961°, E151.86272°, 16 SEP 2015, coll. M. Doe, M. Duncan, A. Fletcher). Three paratype females (♀ #8-10) were reared from eggs deposited by the paratype females collected near Stanthorpe. All types will be deposited in the Queensland Museum, Brisbane.

Etymology. The species group name (*cinereus*, Latin, m., adjective, English translation *ashen* or *like ashes*) refers to the speckled, greyish colouration of the opisthosoma of the adult male.

Diagnosis. Male and female genitalia and other similarities mentioned earlier clearly place this species in the *anomalus* group of the genus *Maratus*. *M. cinereus* is very closely related to *M. lentus*. Both have similar morphology, including distinctive "cuffs" of off-white setae around the proximal tarsi of legs I and II in the males. The colouration of the fan (dorsal opisthosomal plate of the male) of *M. cinereus* is generally grey to blue, green, or purple, corresponding to the grey colour of the eye region. Male *M. lentus* are mostly orange in colour, with a wide band comprised of grey scales or setae on the lateral margins of the fan. Courtship display by males of the two species is similar. Both species tend to kick with one raised and flexed leg III, but *M. cinereus* does this much more frequently. *M. cinereus* moves the fan sideways but does not tend to wave it or to extend the spinnerets during display as do the male *M. lentus*. Both species often move one pedipalp (ipsilateral to the flexed leg III) laterally during display, exposing the paturon of the ipsilateral chelicera to the female. Females of *M. cinereus* and *M. lentus* are virtually indistinguishable.

Description of male (Figures 19-24). Males are 4.2-4.5 mm in length (n=10). The chelicerae are black and glabrous. Grey setae extend diagonally from the black clypeus toward the midline between the chelicerae. The eye region and the sides of the carapace just below the lateral eyes are covered with uniform brown to grey scales. The PME are slightly closer to the PLE than to the ALE.



Figure 19. Living holotype (1-3) and six paratype (4-5, 6, 7-9, 10, 11, 12) male *Maratus cinereus*.



Figure 20. Four paratype (1-3, 4, 5, 6-9) male *Maratus cinereus*. The dorsal opisthosoma and anterior femora III tend to have setae of the same colour. Compare the dull green of one male (2-3) to the light blue of another (7-9).

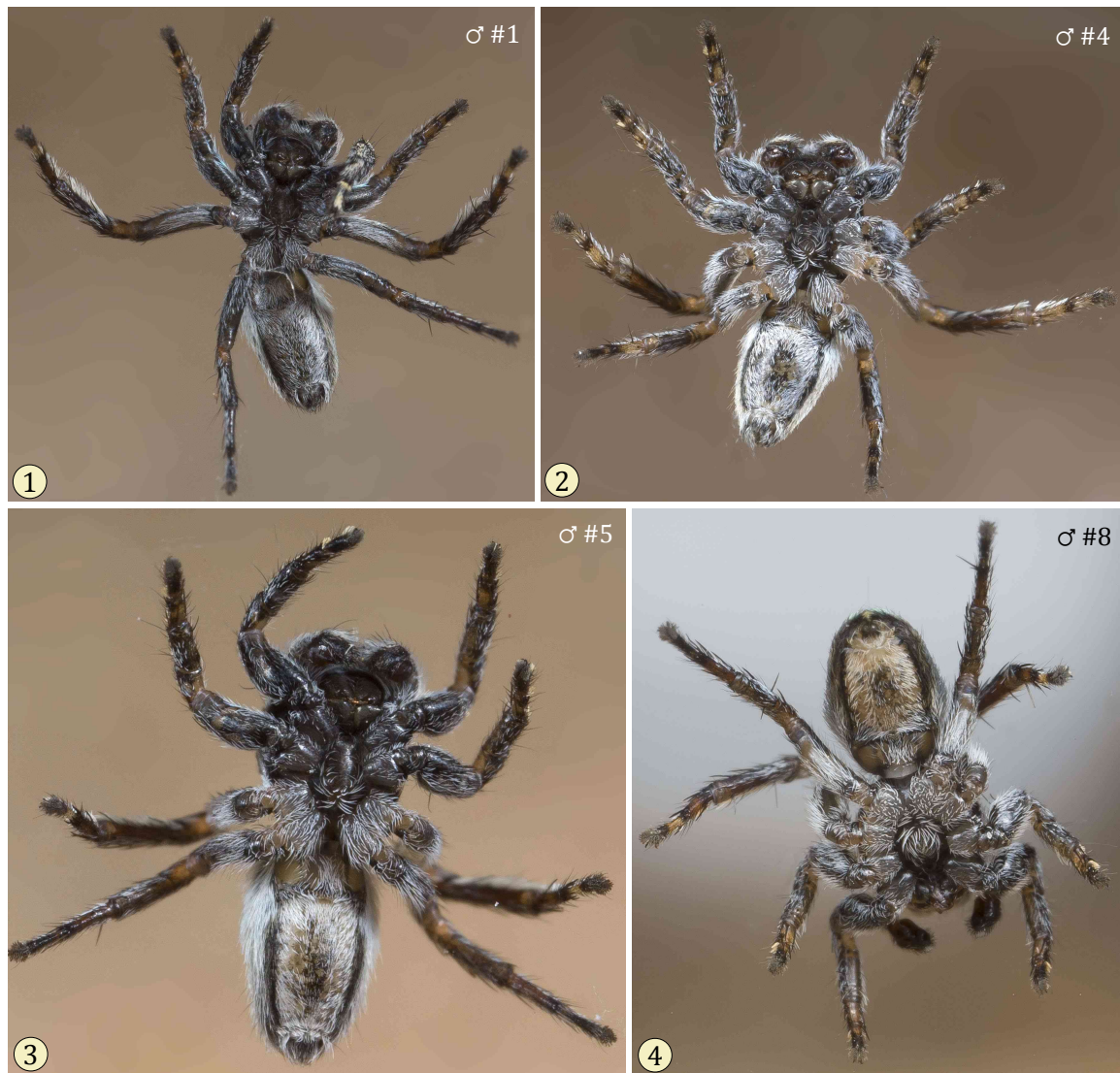


Figure 21. Ventral views of the living holotype (1) and three paratype (2-4) male *M. cinereus*.

The entire carapace is black and glabrous with two short but wide tracts of white scales on either side and a pair of wide, converging bands of white scales extending to the rear behind the posterior eye row. There is no marginal band and the lateral rims of the carapace are black but clearly visible.

The dorsal opisthosomal plate (fan) is covered with setae of variable colour that tend to be more iridescent or brighter in colour laterally. The colour of these setae varies from light brown (particularly near the midline) to light green, purple or blue. On this background are many black spots or speckles, and one pair of small but distinct black spots toward the rear (Figures 19-20). The lateral margins of the fan are moderately fringed with either black or off-white setae. The underside of the opisthosoma is brown but covered with off-white to light brown setae, with a narrow black line separating the venter from the many off-white to grey setae of each margin (Figure 21). The underside of the legs, sternum, labium, endites, and pedipalps is dark brown to black with few setae, except for the many longer, off-white setae beneath the coxae and femora of legs III and IV. The legs are relatively uniform in colouration, covered above with off-white scales. There is a distinct, thin black stripe running along the front of the femur, patella and tibia of each leg III. The scale cover of the front of each femur III tends to match that of the dorsal opisthosoma, but the scale cover of the distal segments of each leg III is more uniform off-white.

Dorsally (or oriented toward the front in live spiders) the pedipalps are covered with long setae, off-white on basal segments and much longer and darker or grey on the cymbium. The detailed structure of each pedipalp is similar to that of other members of the *anomalus* group, with a blunt or bifurcated apex of the outer ring of the embolus above the shorter and sharply pointed apex of the inner ring (Figure 24).

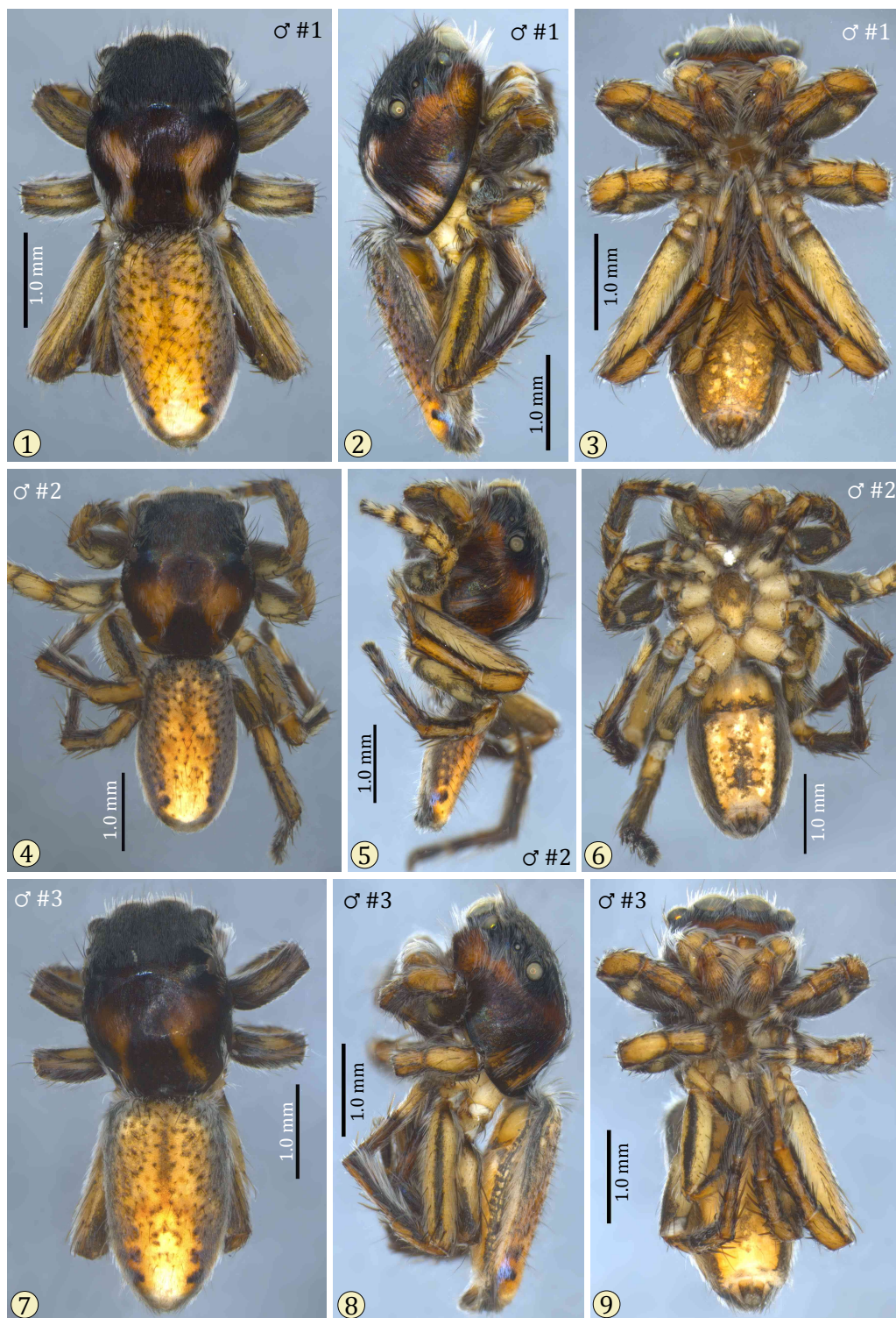


Figure 22. Holotype (1-3) and two paratype (4-6, 7-9) specimens of the male *M. cinereus* in alcohol.



Figure 23. Holotype (9) and seven paratype (1-3 & 11, 4, 5, 6, 7, 8, 10) specimens of the male *M. cinereus* in alcohol.

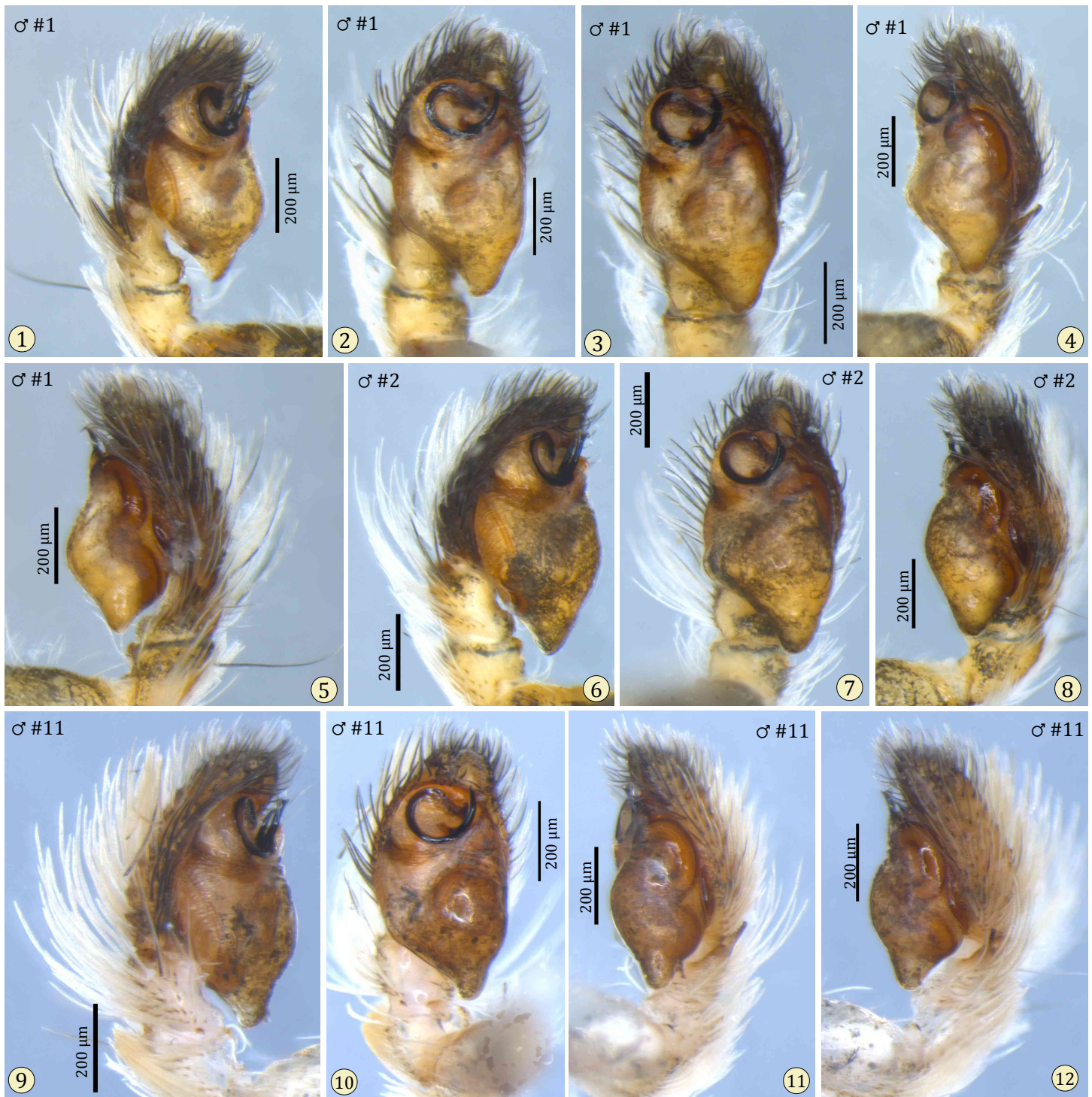


Figure 24. Medial to lateral views of the left pedipalp of the holotype (1-5) and two paratype (6-8, 9-12) male *M. cinereus*.

Description of female (Figures 25-30). Females are 4.4-5.3 mm in length (n=10). Cuticle of the eye region and upper carapace, and a wide median band extending behind the eye region, is dark brown. Otherwise the prosoma, chelicerae, pedipalps, and legs are light brown and translucent, or white in specimens fixed in alcohol. The chelicerae are glabrous, and the clypeus is mostly glabrous except for some longer white setae that originate just below the front eye row and extend forward toward the midline. The eye region and the upper part of the carapace beneath the eyes bears a cover of uniform off-white to brown scales or setae. The sides of the carapace are glabrous and there is no marginal band. The thick lateral rims of the carapace are exposed and glabrous. A wide band of off-white scales may be present (unless worn) on

either side of the upper carapace, just behind the posterior eye row and separated by the wide median band of dark cuticle. The posterior carapace behind these bands is almost completely glabrous. The PME are about the same distance from the ALE as from the PLE.



Figure 25. Views of two different (1-5, 6-8) living female *Maratus cinereus*.



Figure 26. Six different (1-3, 4-6, 7, 8-9, 10-11, 12) living female *M. cinereus*.

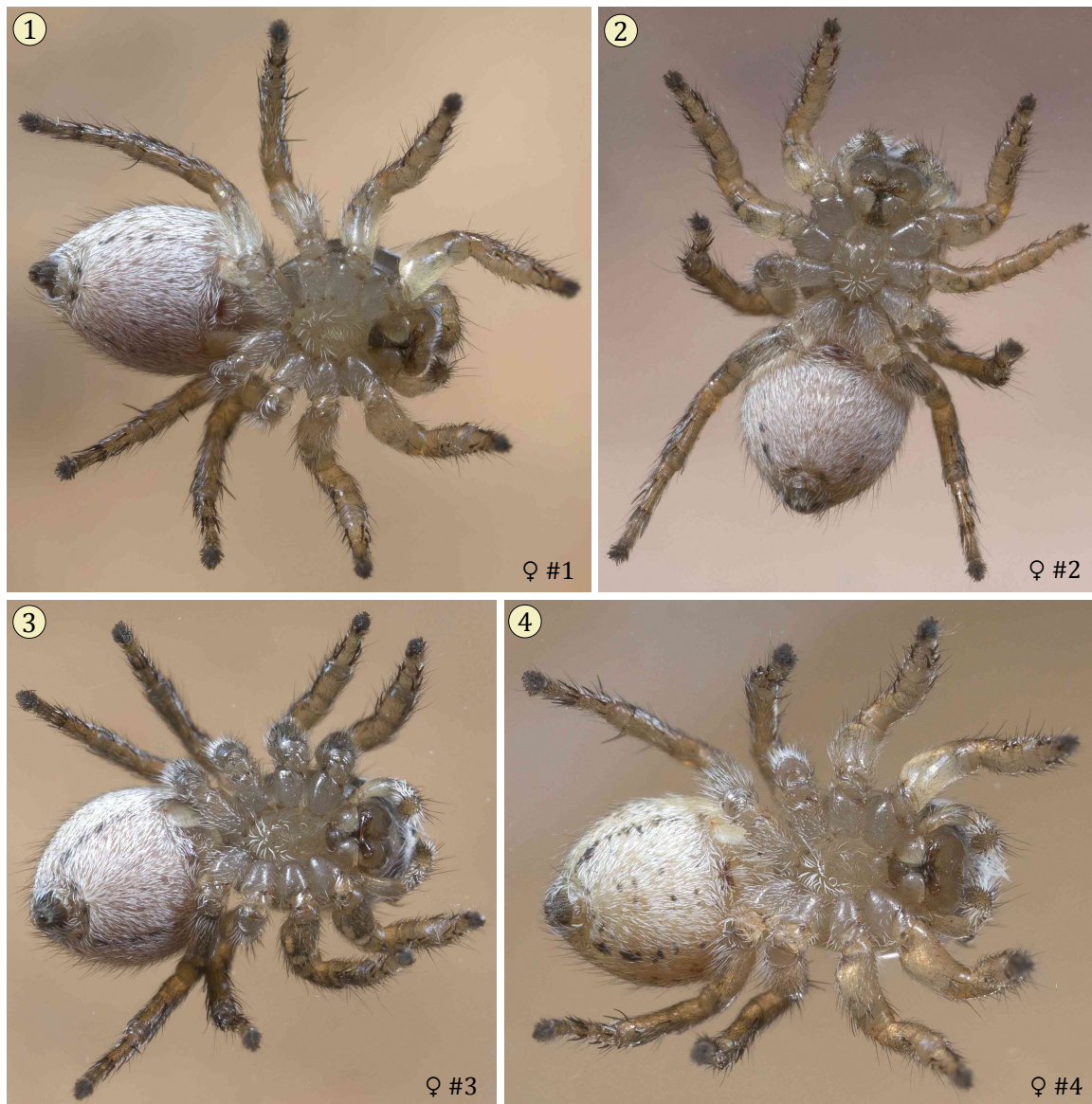


Figure 27. Ventral view of four living female *M. cinereus*.

The dorsal opisthosoma is covered with a variegated pattern comprised of dark brown markings on a background of light brown scales or setae (Figures 25-26). When well-defined (Figure 26: 3, 12) one can observe a dark stripe on either side of the midline, flanked by about 10-12 more-or-less parallel and black lines running in an anterolateral direction from this stripe. On the sides and below, the opisthosoma is light brown with a uniform cover of white to off-white setae (Figure 27). An indistinct pair of dark or black lines may be present on either side of the venter. Scattered white setae are present under the posterior sternum and under the coxae and femora of legs III and IV. Otherwise the underside of the sternum, labium, endites, pedipalps, and legs is light brown, translucent, and mostly glabrous. The legs are uniform in colouration with off-white setae above. Legs I and II are shorter, of about the same length, and mostly glabrous. Legs III and IV are longer with more scale cover, and leg III is the longest.

The epigynum is typical for females of the *anomalus* group, with darker or more sclerotized ducts visible externally at the rear of each fossa, on either side (Figure 30).

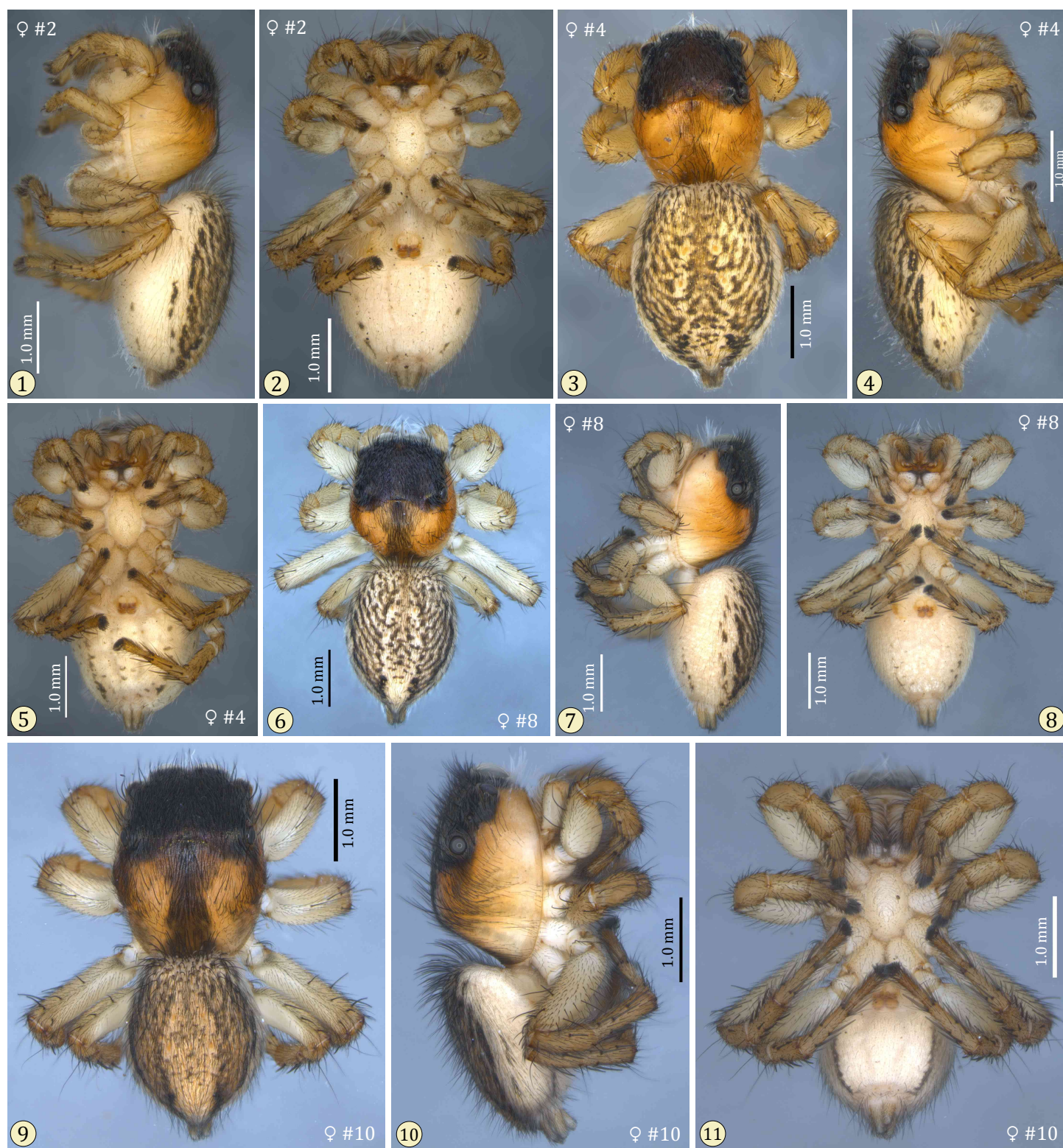


Figure 28. Four female *Maratus cinereus* (1-2, 3-5, 6-8, 9-11) in alcohol. Cuticle that appears light brown and translucent in life is white or off-white when these spiders are fixed in alcohol.

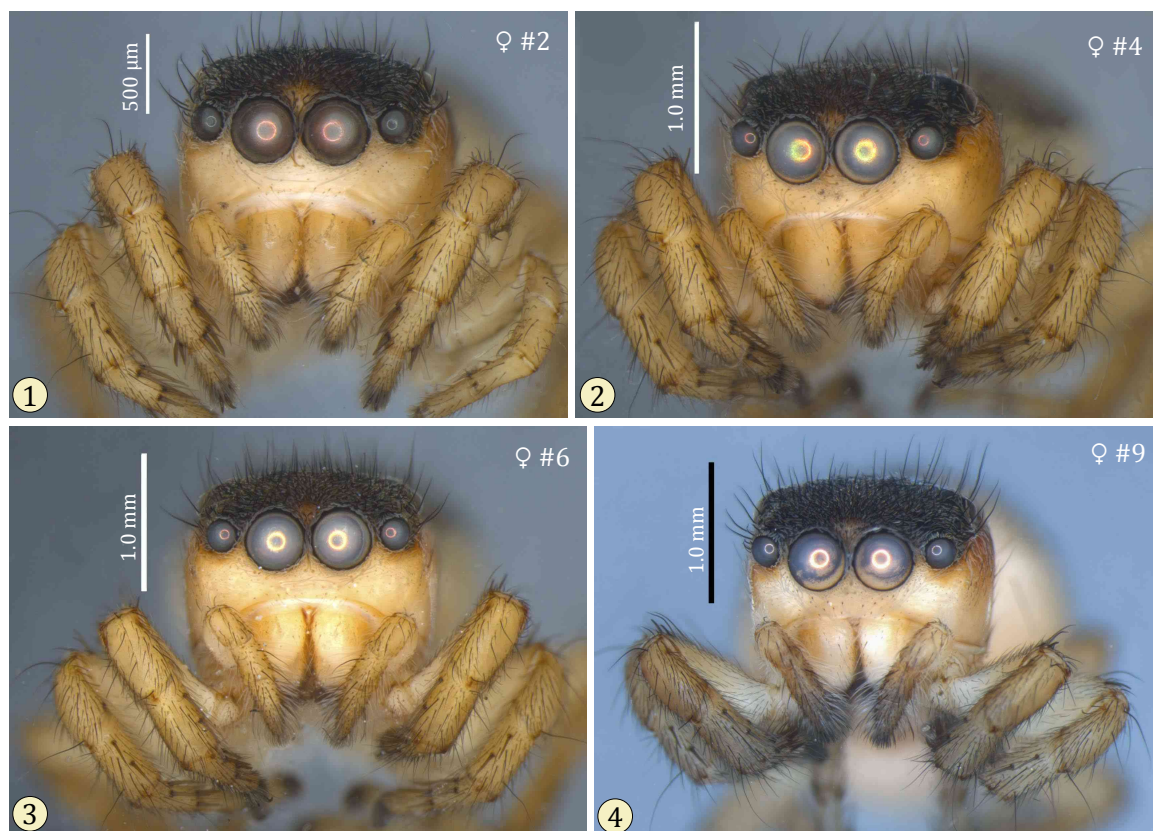


Figure 29. Anterior view of four female *Maratus cinereus* in alcohol.

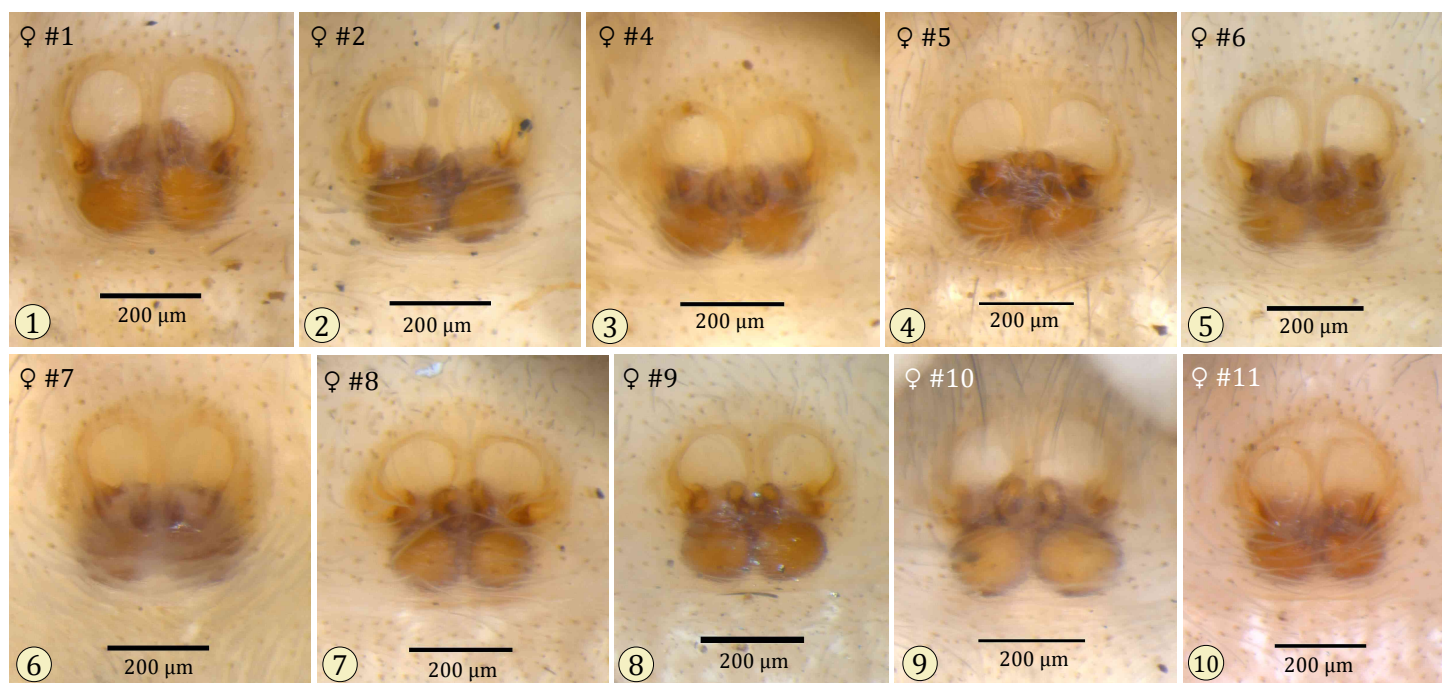


Figure 30. Ventral view of the epigynum of ten different female *Maratus cinereus*.

Immatures. Emergent (second instar) juveniles have dark pigment and a cover of off-white setae in the eye region (Figure 31: 1-3). Penultimate females (Figure 31: 4-8) and penultimate males (Figure 31: 9-13) are similar to adult females in appearance.



Figure 31. Immature *Maratus cinereus*. 1-3, Emergent or second instars. 4-8, Penultimate females. 9-13, Penultimate males. In addition to their bulbous pedipalps, these males also have the vertical tracts of white setae on the sides of the carapace that are characteristic of the adult male.

Courtship display (Figures 32-35). When they display to females, male *Maratus cinereus* crouch and raise their opisthosoma to display the fan without distinct waving but with frequent, shorter and faster sideways movements. Spinnerets are seldom extended during this display. The most active part of this display is the frequent, rapid extension of one leg III, and sometimes both legs III. When close to a female, a male will often move one pedipalp to the side to exposed the underlying paturon of the ipsilateral chelicera, and this pedipalp may be moved slowly up and down in that position.



Figure 32. Display positions of five different *Maratus cinereus*. 7-9, These sequential photographs show movement of the right pedipalp to the side to expose the chelicera behind it.



Figure 33. Display positions of five different *Maratus cinereus*. **1-3,** Three sequential positions showing extension of leg LIII. **5-6,** Two sequential positions showing extension of the spinnerets (6). The right pedipalp was held to the side to expose the right chelicera. **7-9,** Here the fan was completely expanded as the opisthosoma was flattened. Compare this to the width of the partly retracted fan (5-6). Note the light-coloured setae of tarsi I and II, and their distinctive proximal "cuffs."



Figure 34. Sequential frames (0.04s/frame or 25fps) showing the courtship display of a male *Maratus cinereus*. Frequent, rapid kicks with the elevated leg R3 are indicated with arrows. Between kicks, this leg was held in an elevated but flexed position. There was little to no movement of the fan and spinnerets during this display.



Figure 35. Consecutive but not sequential frames selected from a 25fps video of the courtship display of a male *Maratus cinereus*, to illustrate successive positions. Leg movement is highlighted with arrows. There was some movement of the fan during this sequence but it was not waved. Even when both legs III were moved rapidly (10-21), their movement was not synchronized or bilaterally symmetrical.

Habitat. *Maratus cinereus* was found on grasses in an open woodland near Stanthorpe, Queensland (Figure 36).



Figure 36. Grassy habitat of *M. cinereus* near Stanthorpe, Queensland. Photograph by Michael Doe.

***Maratus julianneae* Baer & Whyte 2016**

Only the male *Maratus julianneae* has been described, recorded from Tussock grass and Callitris grass at two sites in Carnarvon Station, central Queensland. The type male is 4.21 mm in length. The distinctive shape of the two apices of the embolus clearly places this species in the *anomalus* group with the other grassland peacock spiders (Baehr & Whyte 2016).

Diagnosis. Except for the pedipalps and legs III, the pattern of scales and setae of the body and appendages of *M. julianneae* resemble those of *M. cinereus*. This similarity extends to the detailed pattern of the dorsal opisthosoma (fan), but the pair of small black spots toward the rear of the fan are larger and closer to the front in *M. julianneae*. The pedipalps are quite different when viewed from the front, with the presence of a band of bright white setae dorsally in *M. julianneae*, contrasting with the dark ventral bulb of each pedipalp (Figure 37: 7). Legs III are also different, black and fringed with many black setae from the femur to the proximal metatarsus, then distally covered with white setae in *M. julianneae*. In *M. cinereus* legs III are quite different, covered with white to off-white scales and setae, and marked along their length by a narrow black stripe. Use of legs III in courtship display is also quite different.

Courtship display. The male shown here (Figures 37-38) is the holotype described by Baehr & Whyte (2016). Courtship is relatively simple like that of *M. anomalus*, with the fan elevated and both legs III extended and elevated in a partially flexed position. The pedipalps, covered dorsally with bright white setae, are held together during this display so that the white setae of both pedipalps form a white band in front of the clypeus, under the anterior eye row. This fixed posture is maintained as the male steps from side to side.



Figure 37. Living holotype male *Maratus julianneae* from Carnarvon Station, Queensland. Note the iridescent rear margins of the dorsal opisthosomal plate. Overall the scale cover is grey, with numerous, small brown spots on all except the most posterior part of the fan. As for other male grassland peacock spiders, there is no marginal band but there are two short vertical bands on each side of the carapace and a wide white band behind each PLE.

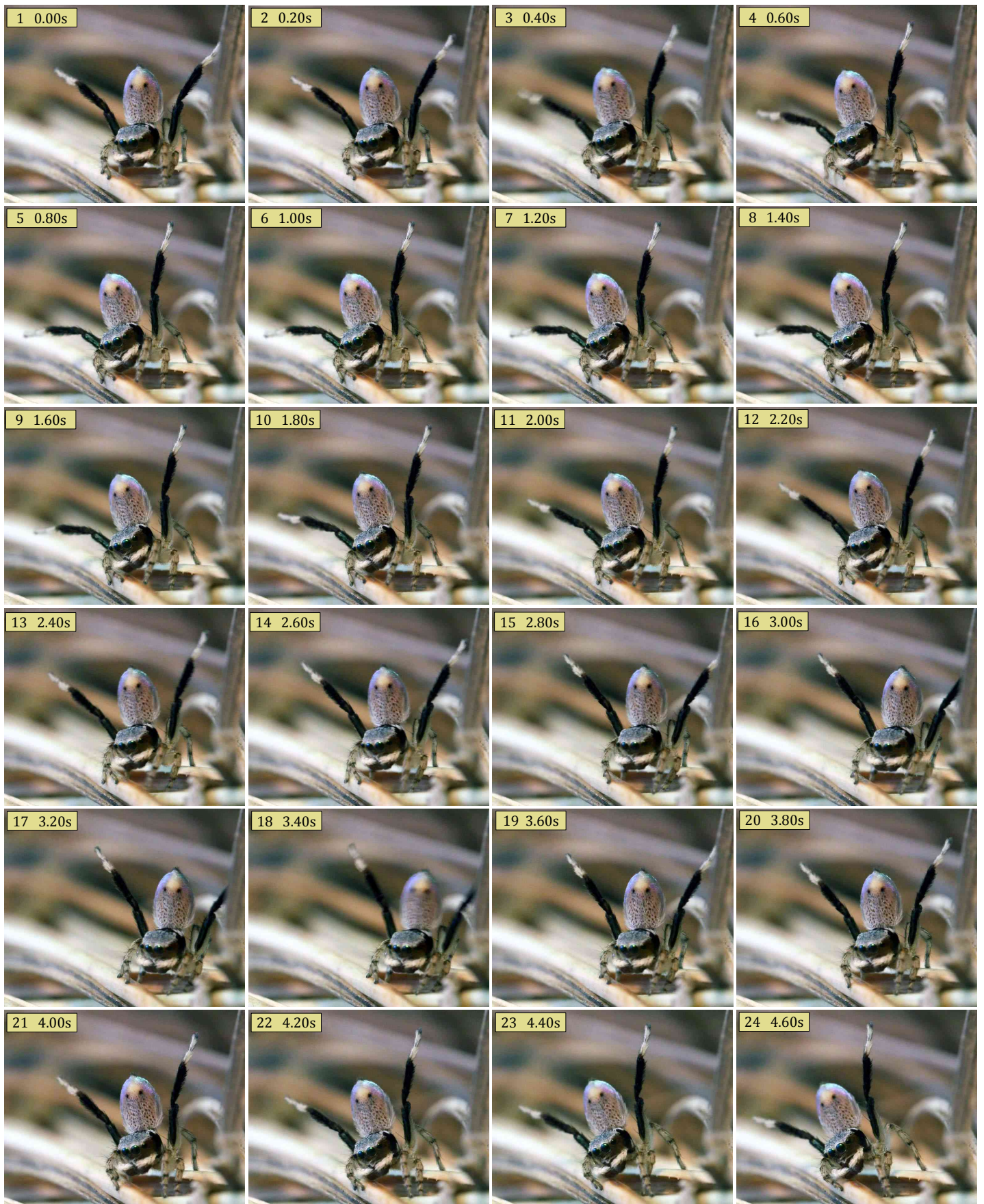


Figure 38. Sequential frames (5fps from a 25fps video) showing the display of the holotype male *M. julianneae*. This male first stepped to his right (1-5), then to his left (9-17), then back to his right (19-24) with legs, pedipalps, and fan fixed.

***Maratus lentus*, new species**

Type specimens. The holotype male (♂ #1), three paratype males (♂ #2-4), and five paratype females (♀ #1-5) were collected near Copeton, New South Wales (S29.94025°, E150.93786°, 13 SEP 2015, coll. M. Doe, M. Duncan, A. Fletcher). All types will be deposited in the Australian Museum, Sydney.

Etymology. The species group name (*lentus*, Latin, m., adjective, English translation *slow*) refers to the slow and deliberate movement of the adult male during courtship.

Diagnosis. *M. lentus* is very close to *M. cinereus* but males can be identified by the orange colour of their eye region and dorsal opisthosomal plate (fan), and the presence of a wide, grey dorsal band along each lateral margin of the fan. *M. lentus* males (4.0-4.1 mm in length) also tend to be smaller than *M. cinereus* (4.2-4.5 mm). Courtship display by males of the two species is similar with respect to general posture, intermittent extension or kicking of one leg III, and movement of one pedipalp to expose the underlying paturon of the ipsilateral chelcera. However, *M. lentus* males do little kicking with legs III and mostly wave their elevated fan from side to side with the spinnerets extended and separated above the fan. Most active movement during display by the male *M. cinereus* is associated with frequent kicking, whereas active movement by *M. lentus* is associated with movement of the fan from side to side (waving). Female *M. lentus* look much like female *M. cinereus*, so capture of the males is a prerequisite for identification.

Description of male (Figures 39-42). Males are 4.0-4.1 mm in length (n=4). The chelicerae and clypeus are brown, glabrous, and translucent. Long white to light orange setae extend anteromedially below the anterior eye row. The eye region and sides of the carapace below the lateral eyes is uniformly covered with light orange to light brown scales. This scale cover ends abruptly behind the posterior eye row, and the posterior carapace is mostly black except for a wide tract of white scales behind each PLE. Behind the PLE the sides of the carapace are black and glabrous, and there is no marginal band to conceal the lateral rims of the carapace, but two short bands of white scales extend dorsally from the lateral rim on each side. The PME are almost equidistant between the ALE and PLE.

The dorsal opisthosomal plate (fan) has a triangular central area, wide at front and tapering to a vertex at the rear, covered with light orange scales with many scattered, small red-orange spots (Figures 39-40). On either side of this is a broad gray lateral band terminating at the rear with a small black spot, and flanking each lateral band is a narrow fringe of white to off-white setae. The sides of the opisthosoma are covered with long white to off-white setae (Figure 53: 1-2). The ventral opisthosoma is light brown with a sparse cover of short off-white setae, with a prominent black line on either side (Figure 49: 7).

Legs I and II are about the same length, covered with off-white to light-orange scales and setae. The cuticle of legs I and II is light brown and translucent, except for narrow dark rings that highlight the metatarsus and small but distinct "cuffs" of setae associated with the proximal tarsus. Legs III and IV are longer than legs I and II, and legs III are the longest. Legs III and IV are covered with white to off-white or light orange setae, but legs III have a narrow black anterior stripe extending from the base of the femur to the distal end of the tibia. As with *M. cinereus*, this stripe is visible from the front when the respective leg is elevated during courtship.

Dorsally the pedipalps have a dense cover of long light-orange setae (Figures 39: 3, 40: 2). Distal setae of the pedipalps are grey. As in other members of the *anomalus* group, the apex of the outer ring of the pedipalp is blunt or bifurcated at the end, and below this the apex of the short inner ring is pointed (Figure 42).



Figure 39. Living holotype (1-3) and paratype (4-9) male *Maratus lentus*. **3**, Note the distinct setal "cuffs" of the proximal tarsi of legs I and II. **4**, The black stripe at the front of each leg III is visible from the front when that leg is raised as shown here.



Figure 40. Two living paratype male *Maratus lentus* (1-7, 8). **1**, Note the two short bands or patches of white setae on the right side of the carapace. **2**, Most of the carapace is black but the chelicerae and clypeus are brown, translucent, and mostly glabrous as seen here. **6**, When preparing to jump *Maratus* flex their longer legs III against the surface as shown here. This allows them to exert a ground force over a greater distance as legs III are extended in contact with the surface.

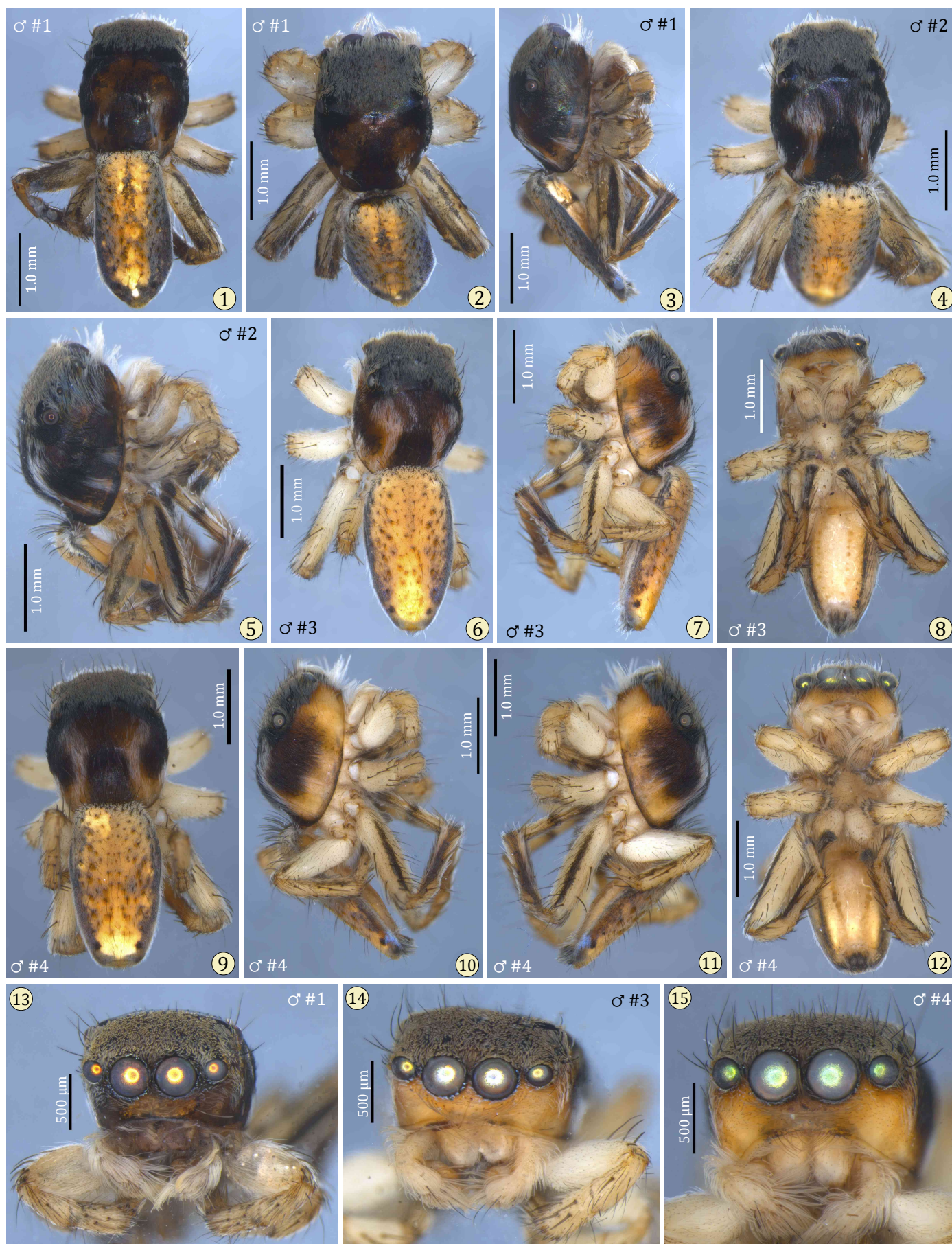


Figure 41. Holotype (1-3 & 13) and three paratype (4-5, 6-8 & 14, 9-12 & 15) male *M. lentus* fixed in alcohol.

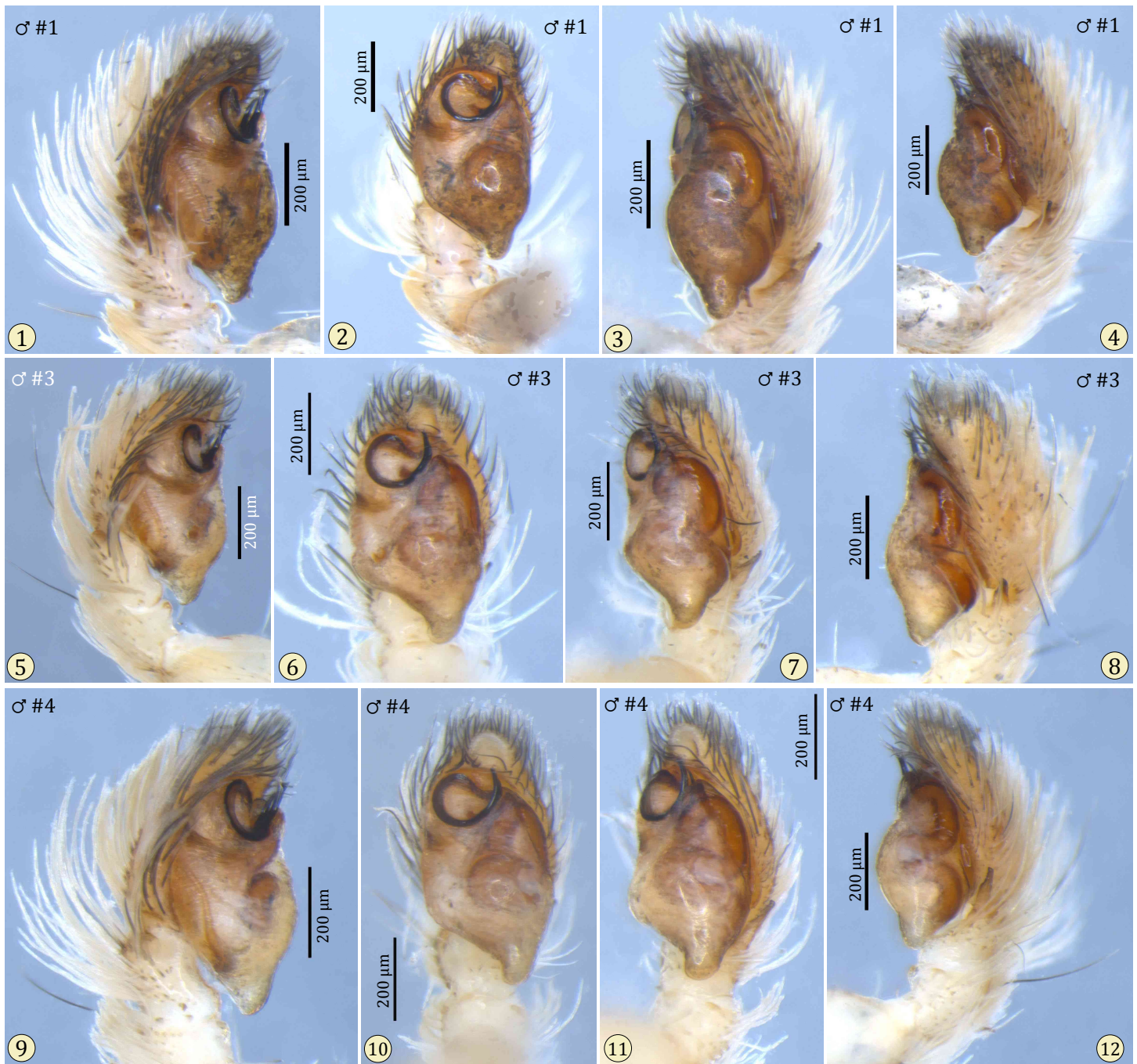


Figure 42. Medial to lateral views of the left pedipalp of the holotype (1-4) and two paratype (5-8, 9-12) male *Maratus lentus*.

Description of female (Figures 43-47). Females are 4.1-5.2 mm in length (n=4). The chelicerae, clypeus, and sides of the carapace are light brown, translucent, and glabrous. Long white setae originating below the anterior eyes extend anteriomedially over the chelicerae. The upper carapace is dark, as is a glabrous, broad median band extending to the rear of the carapace. The eye region and upper carapace below the lateral eyes are covered with light brown to off-white scales. On either side a band of off-white to light brown scales extends toward the rear of each PLE, converging to flank the dark, glabrous median band. The PME are about the same distance from the ALE as from the PLE. The dorsal opisthosoma is covered with off-white to light brown pigmented scales, boldly marked with a series of 5-8 more or less distinct, dark brown or black diagonal lines oriented in a posteromedial direction from the lateral margin, and ending on either side of a median figure that may be defined by a line of lighter spots laterally, and a series of forward-pointing, dark chevrons posteromedially (Figures 43-44).



Figure 43. Three living female *Maratus lentus* (1-5, 6-10, 11-12).



Figure 44. Three living female *Maratus lentus* (1, 2-8, 9-12).

The sides and underside of the opisthosoma are light brown or off-white in colour, with a covering of white scales. The ventral opisthosoma may be clear of markings, or it may be mottled with dark spots (Figure 45). The sternum, coxae, labium, and endites are all light brown and translucent, and mostly glabrous except for a row of white setae around the posterior sternum. Legs I and II are shorter and of similar length, legs III and IV much longer and also of similar length. All legs are light brown, translucent, and mostly glabrous. They are almost completely glabrous ventrally. Above the legs, particularly legs III and IV, bear a moderate cover of off-white scales and setae. The pedipalps are also light-brown, translucent, and bear many longer off-white setae.

The epigynum is typical for members of the *anomalus* group, with dark or highly sclerotized ducts visible on either side at the rear of each fossa (Figure 46).



Figure 45. Ventral view of three living female *Maratus lentus*. 1-2, Note the mottling of the ventral opisthosoma in these females.

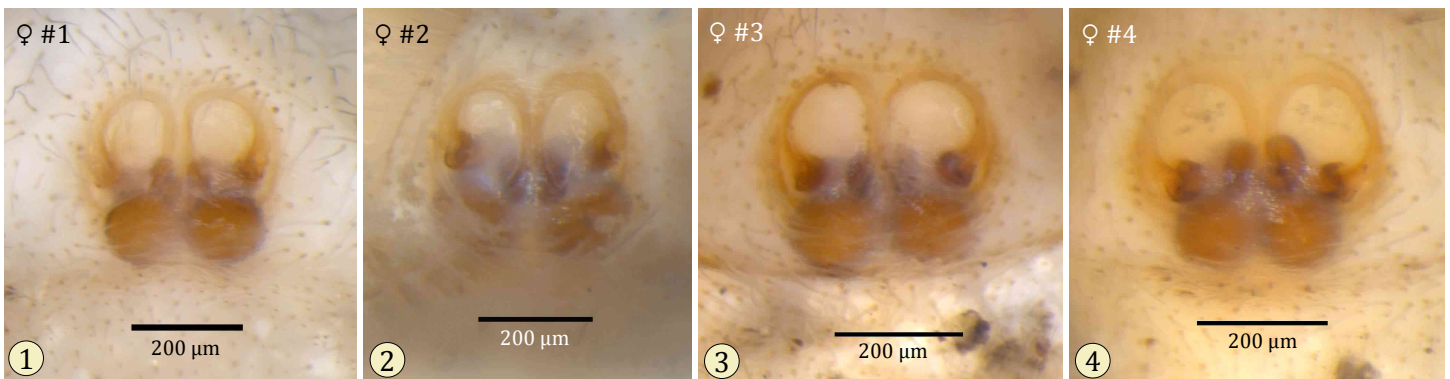


Figure 46. Ventral view of the epigynum of four female *Maratus lentus*. Note variation in the shape and relative size of the fossae, width of the septum separating the fossae, shape and size of the large posterior spermathecae, and relative position of the sclerotized ducts on either side of each fossa. In (1) and (3) the medial and lateral ducts are at about the same position relative to the midline. In (2) the medial ducts are well behind the lateral ducts, and in (4) the lateral ducts are well behind the medial ducts. Intraspecific variation like this can be greater than interspecific variation within this group, making the detailed structure of the epigynum of little use for identification at the species level.

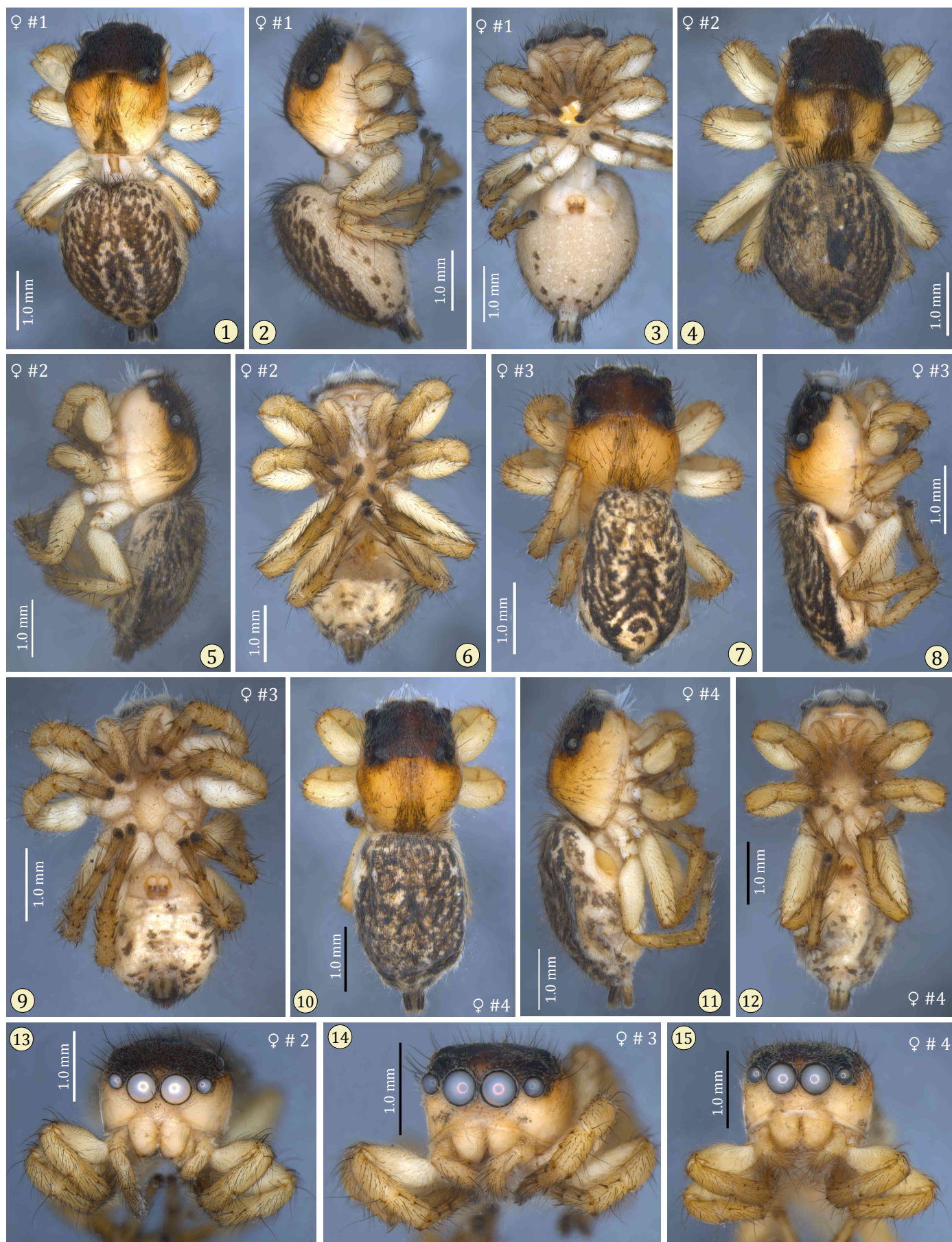


Figure 47. Four female *M. lentus* (1-3, 4-6 & 13, 7-9 & 14, 10-12 & 15) fixed in alcohol.

Immatures. Emergent (second instar) *Maratus lentus* resemble those of related species, with a covering of white setae in the eye region and just behind the posterior eye row (Figure 48).



Figure 48. Emergent (second instar) *Maratus lentus* (reared).

Courtship display (Figures 49-52). The male *Maratus lentus* crouches, elevates the fan and waves it from side to side (~2-5/s), extends and frequently wags the finger-like spinnerets above the fan, and occasionally kicks (rapidly extends) one or both elevated legs III. As in the closely related *M. cinereus*, one pedipalp is often moved laterally to expose the paturon of the underlying chelicera (Figure 50: 9-10). Two different display patterns were observed. In the first (Figure 51) waving of the fan with extension of the spinnerets alternated with relatively infrequent kicks with one leg III. In the second (Figure 52) both legs III were rapidly extended and depressed then raised, then flexed and lowered more slowly.

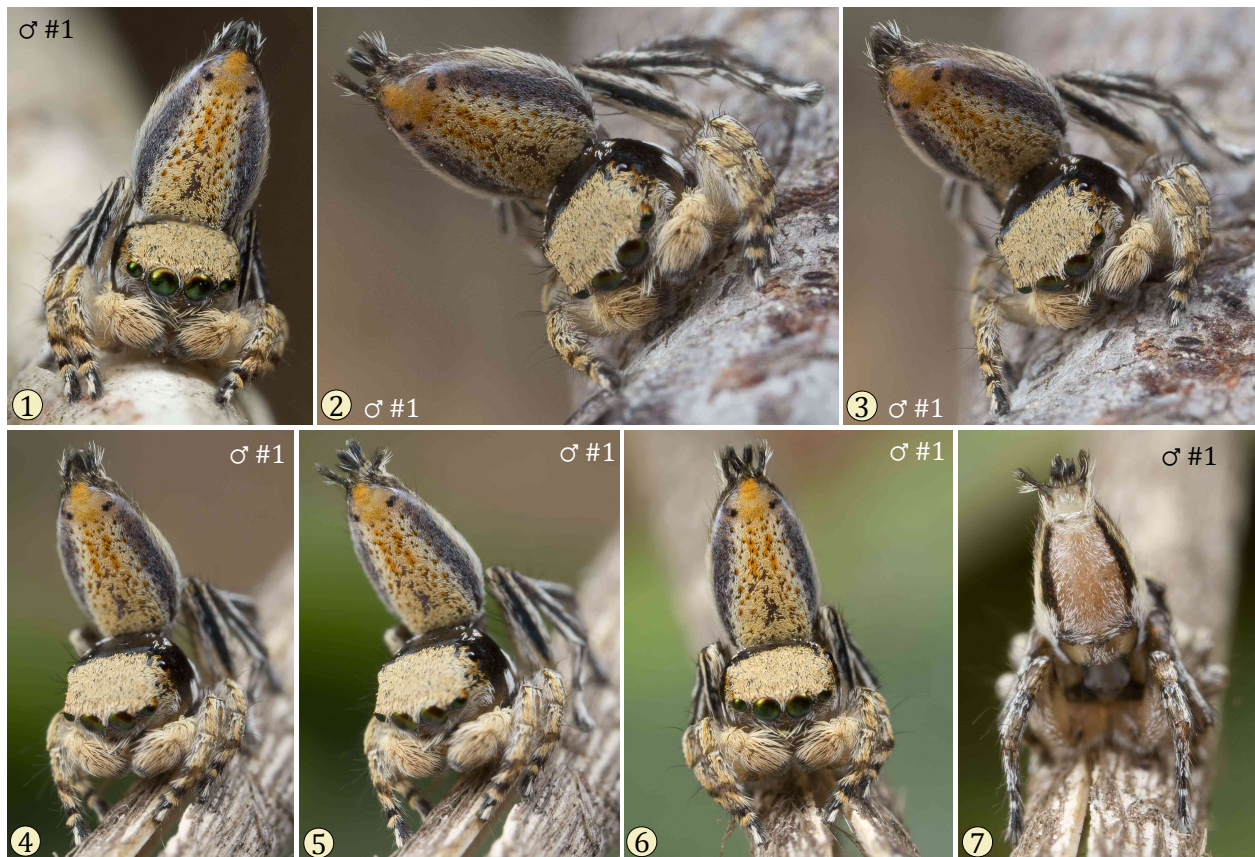


Figure 49. Views of display by the holotype male *Maratus lentus* in front of a female. **2-3**, When a single leg III is kicked, it is elevated and flexed as shown here, then extended rapidly. **4-5**, Note movement of the extended spinnerets between these sequential photographs. **7**, Ventral view showing sparse cover of shorter setae between prominent black marginal bands of the venter, and the inflated base of the spinnerets.

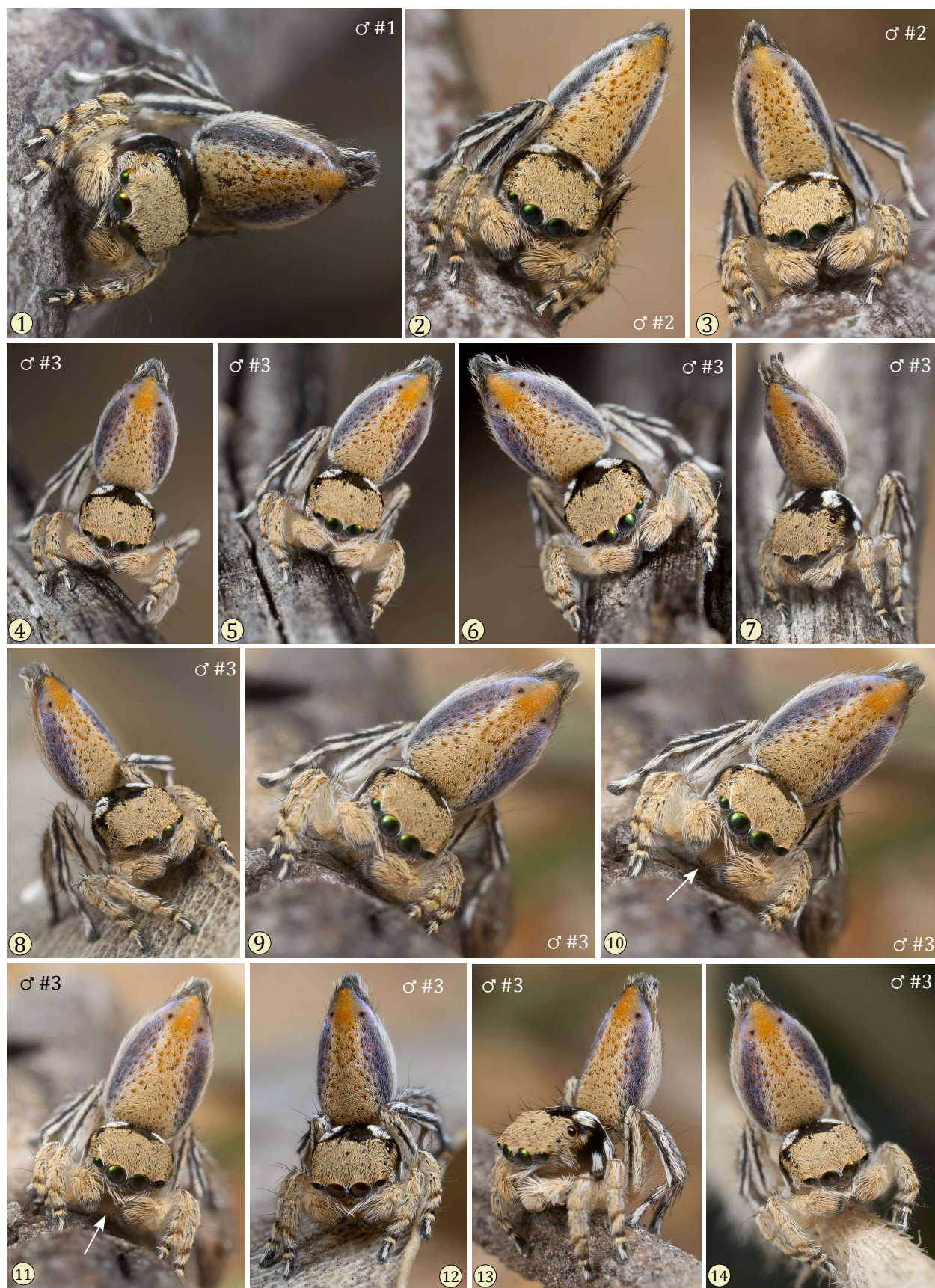


Figure 50. Display positions of holotype (1) and two paratype (2-3, 4-14) male *Maratus lentus*. 9-10, Note the elevated and flexed leg RIII in this sequence. This exposes the stripe of this leg to view from the front. In (10), the right pedipalp has been moved to the side to expose the chelicera (arrow). In this position it may be moved slowly up and down. 11, The arrow points to the exposed chelicera.

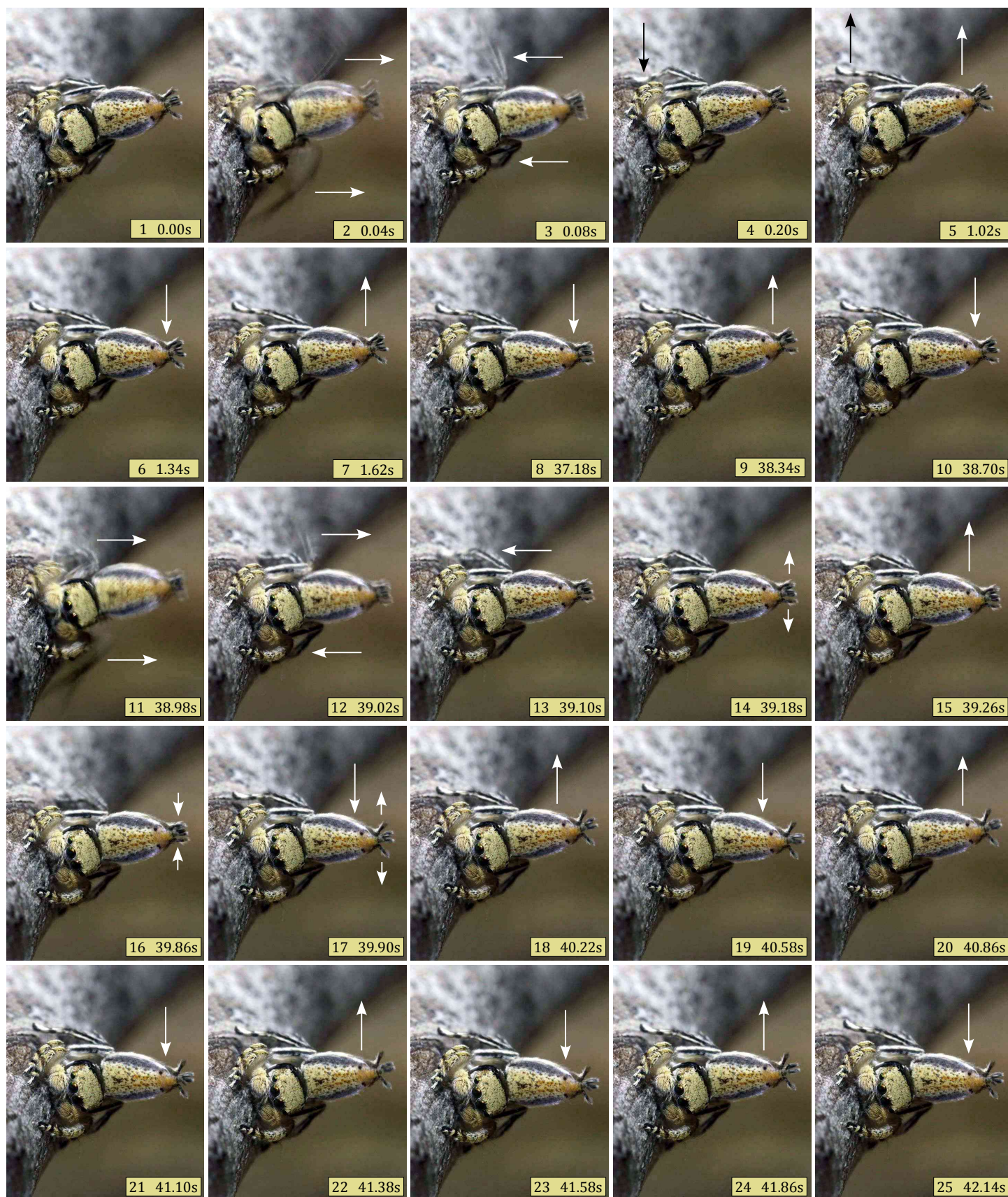


Figure 51. Selected sequential but not consecutive frames from a 25fps video of display by the holotype male *M. lentus*. Arrows indicate waving of the elevated fan from side to side, extension of the pedipalps, and relatively infrequent but rapid kicks with legs III (2-4, 11-13).

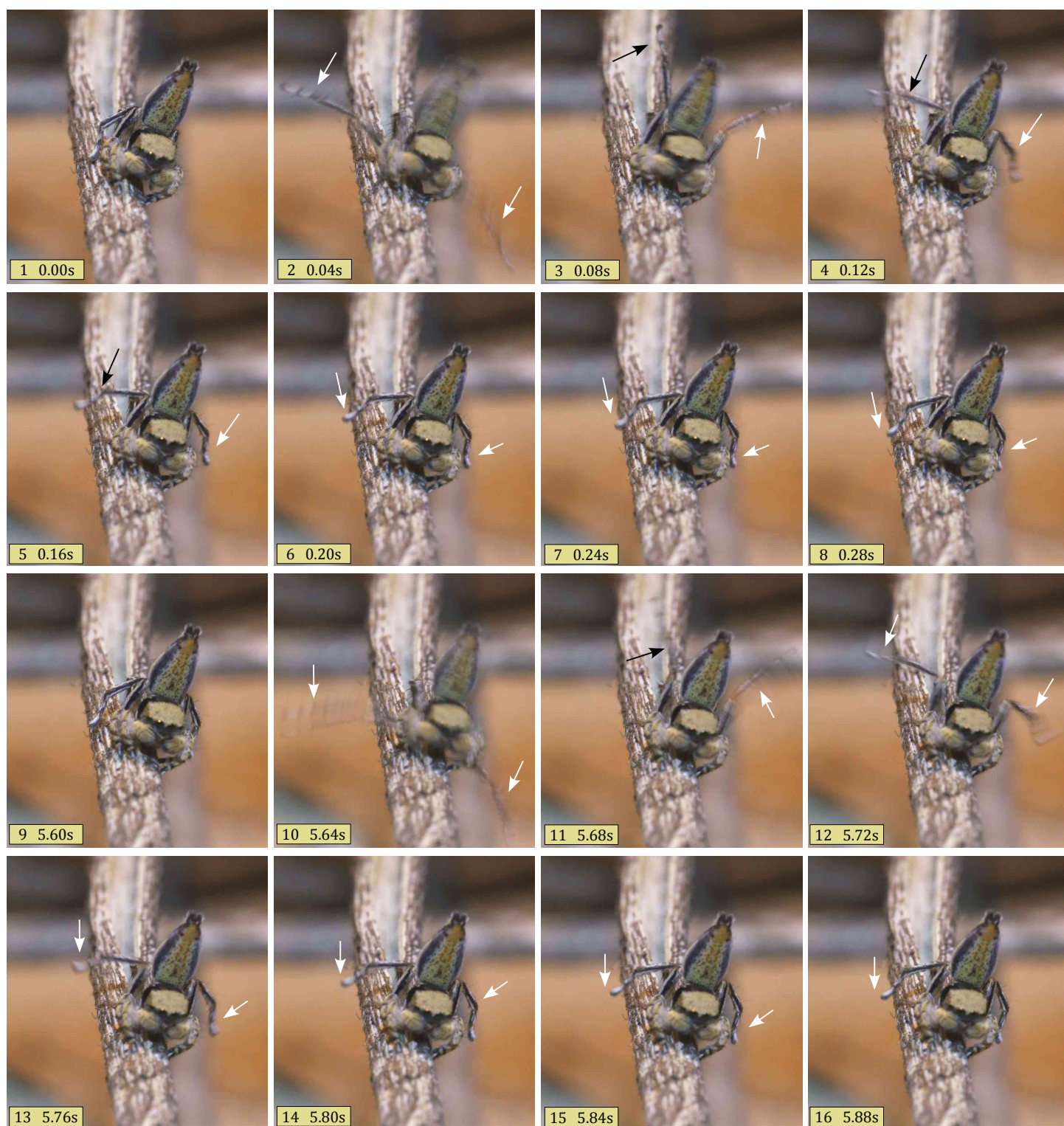


Figure 52. Two sets (1-8, 9-16) of consecutive frames from a 25fps video of display by the holotype male *M. lentus*. Arrows indicate movement of legs III. Each set shows one cycle of rapid extension and depression of both legs III, followed by rapid elevation of these legs to a near vertical position, in turn followed by slower depression and flexion of these legs.

Mating. Three views of a mating pair of *M. lentus* are shown in Figure 53. Typical for *Maratus*, the female can rotate her opisthosoma by 180° to facilitate mating.



Figure 53. Three views of the holotype male *M. lentus* mating with a paratype female. Note the long white to off-white setae on the sides of the male opisthosoma, below the dorsal plate or fan.

Habitat. *Maratus lentus* was found in grasses near Copeton, New South Wales (Figure 54).



Figure 54. View of type locality of *M. lentus* near Copeton, New South Wales. Photograph by Michael Doe.

***Maratus neptunus*, new species**

Type specimens. The holotype male (♂ #1), two paratype males (♂ #2-3) and one paratype female (♀ #1) were collected at Butterwick, New South Wales (S32.65402°, E151.65008°, 6 OCT 2014, coll. J. Otto). Four paratype males (♂ #4-7), and two paratype females (♀ #3-4) were collected near Tamworth, New South Wales (S31.20371°, E151.08811°, 27 MAY 2015, coll. M. Doe, M. Duncan, A. Fletcher). Three paratype males (♂ #8-10) and two paratype females (♀ #2, 5) were reared from eggs deposited by the Butterwick female. All types will be deposited in the Australian Museum, Sydney.

Etymology. The species group name (*neptunus*, Latin, m., noun in apposition, English translation *Neptune*, the Roman sea god) was selected to suggest the bright marine blue colour of the adult male. The three bold black stripes of the dorsal opisthosoma can also be associated with Neptune's trident.

Diagnosis. The detailed structure of male and female genitalia is similar to that of other members of the *anomalus* group. Colouration and display of legs III of the male, black with white setae on the metatarsus and tarsus, is similar to *M. julianneae* except for a patch of white scales or setae on each patella III. Otherwise the colour and scale patterns of *M. neptunus*, including three prominent dark stripes on a uniform field of bright iridescent scales of the dorsal opisthosoma, are quite different (Figure 2). Females may be distinguished from other grassland peacock spiders by the presence of three prominent dark brown stripes along the length of the dorsal opisthosoma.

Description of male (Figures 55-62). Male *M. neptunus* are 4.2-4.6 mm in length (n=8). The chelicerae, clypeus and sides of the carapace are dark brown or black and glabrous. A cover of dull, red-orange scales surrounds the eyes and the front and sides of the eye region. Behind this, the carapace is black and a wide median, glabrous, black band extends to the rear of the carapace. There is no marginal band but two short bands of white scales extend upwards from the exposed rim of the margin. A wide band of bright white scales runs medially behind each PLE, then turns and runs toward the rear of the carapace on either side of the black median band.

The dorsal opisthosomal plate (fan) is densely covered with iridescent grey or blue or purple scales, interrupted by a three black stripes, one at the median line and one on either side of the median. This three-striped pattern is a useful field mark for *M. neptunus* males and females. In one male from Tamworth (Figure 56: 11-12) the three black stripes were bordered with red scales. Each of the lateral black lines terminates in a small more-or-less distinct spot at the rear, a characteristic of males within the *anomalus* group. The fan is fringed laterally with long white setae. The sides of the opisthosoma are covered with long white setae, and the venter, light brown with few setae at the median, is flanked with a black line near the margin on either side (Figure 60). The coxae, sternum, labium, and endites are light brown and glabrous except for scattered white setae. Legs I and II are about the same length. Legs III and IV are longer and legs III are the longest. Legs I, II and IV are similar in colour, covered with white setae interrupted by a black or brown ring at each joint. Legs III are black from the base of each femur to the proximal metatarsus, with some white scales on the dorsal patella. The distal metatarsus and tarsus of leg III are covered with white setae.

The pedipalps are covered with long, bright white scales above and on their anterior surfaces. The detailed structure of the male pedipalp is similar to that of other members of the *anomalus* group, with a long circular outer ring of the embolus terminating anterolaterally with a blunt or bifurcated apex, and a short inner process beneath this terminating with a smaller, pointed apex (Figures 61-62).

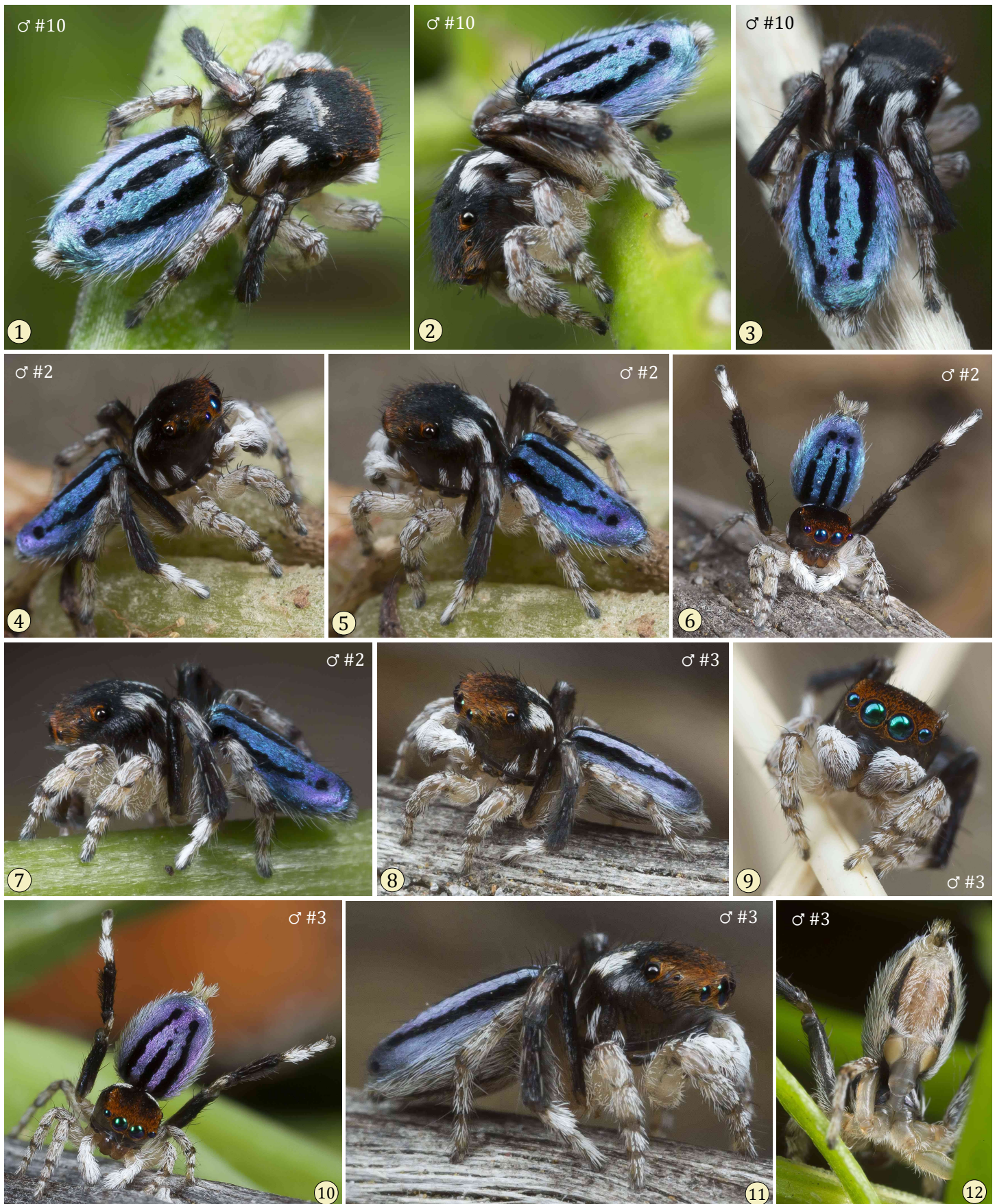


Figure 55. Three paratype (1-3, 4-7, 8-12) male *M. neptunus* from Butterwick, New South Wales. **12**, Rear view during display. Note extreme extension of the pedicel.



Figure 56. Four paratype (1-3, 4-5, 6-10, 11-12) male *Maratus neptunus* from Tamworth, NSW.



Figure 57. Two living paratype male *M. neptunus* (1-6, 7-12), reared from Butterwick, NSW parents.



Figure 58. Holotype (1-5) and two paratype (6-9 & 13, 10-12 & 14) male *M. neptunus* fixed in alcohol.



Figure 59. Paratype male *M. neptunus* fixed in alcohol.



Figure 60. Underside of three living paratype male *M. neptunus*.

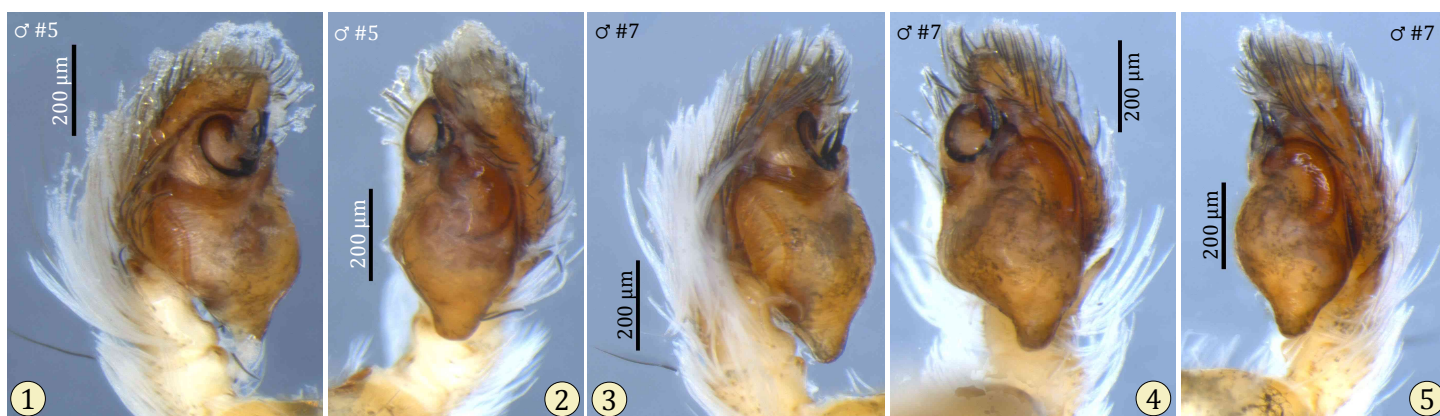


Figure 61. Medial to lateral views of the left pedipalp of two paratype male *M. neptunus* (1-2, 3-5).

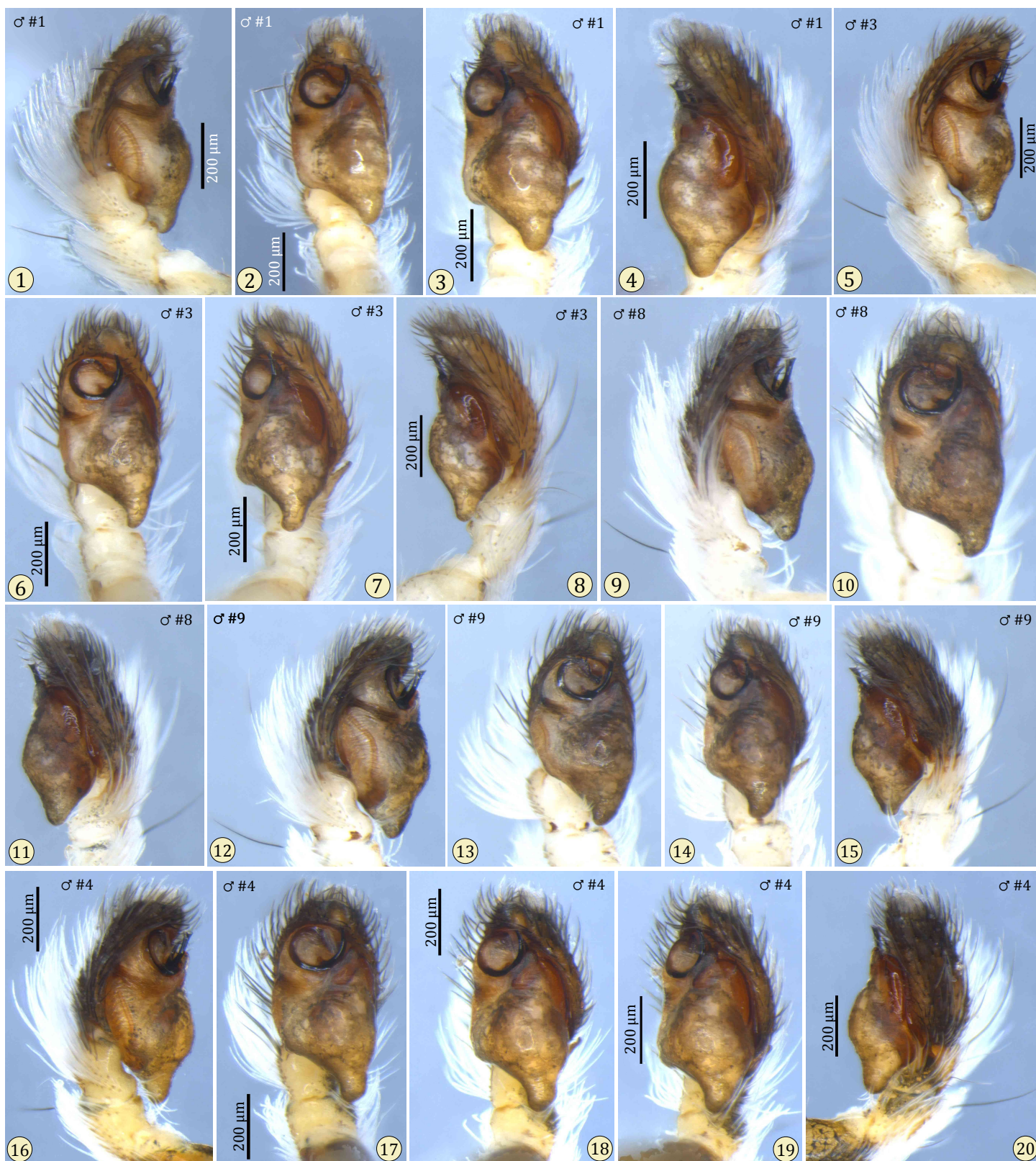


Figure 62. Medial to lateral views of the left pedipalp of the holotype (1-4) and four paratype (5-8, 9-11, 12-15, 16-20) male *Maratus neptunus*.

Description of female (Figures 63-68). Female *M. neptunus* are 4.7-5.7 mm in length (n=5).

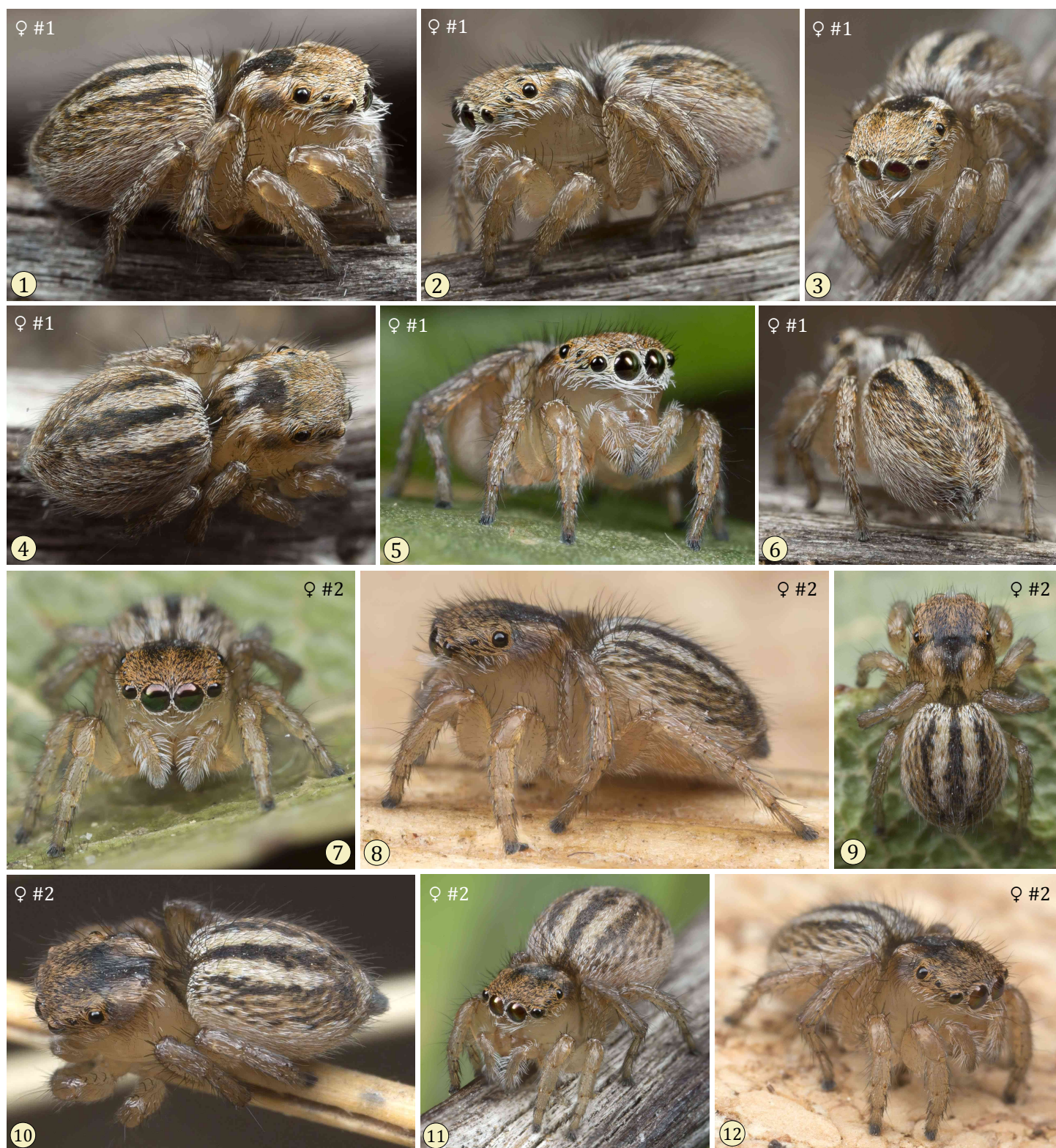


Figure 63. Two living female *Maratus neptunus* (1-6, 7-12). 4, The three dark brown stripes on the opisthosoma of the female correspond to the three black or dark red stripes on the opisthosoma of the male.



Figure 64. Two living female *Maratus neptunus* (1-4, 5-10). **10**, In some individuals a series of bold chevrons can be seen behind the median stripe of the dorsal opisthosoma.



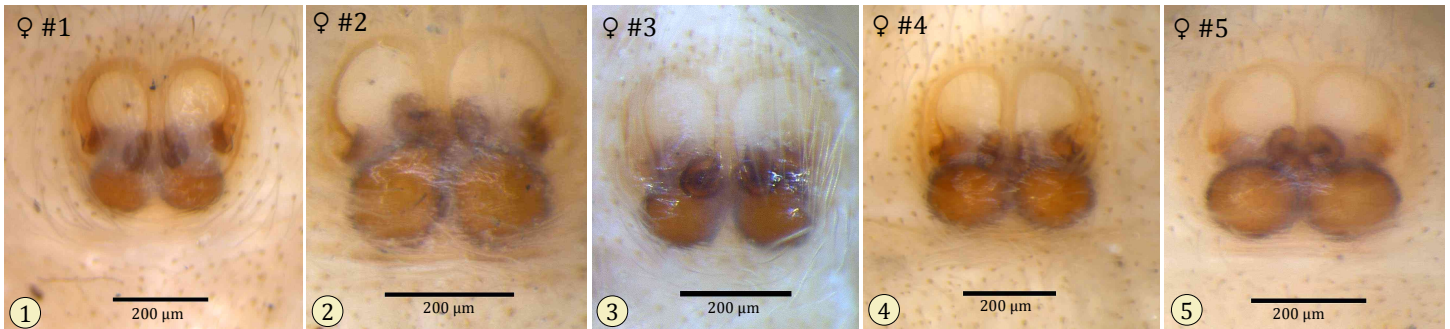
Figure 65. Ventral view of three living female *Maratus neptunus*.



Figure 66. Three female *Maratus neptunus* fixed in alcohol (1-3 & 5, 4 & 6-8, 9-11).



Figure 67. Two female *Maratus neptunus* fixed in alcohol (1-3 & 5, 4).



Female 68. Ventral view of epigynum of five female *Maratus neptunus*. The anterior direction is toward the top of each photograph. Note variation in the relative size of the large posterior spermathecae and the position of the heavily sclerotized ducts at the rear of each fossa.

The clypeus and chelicerae are light-brown, translucent and glabrous. Beneath the anterior eye row long white setae extend anteromedially. The eye region and the sides of the carapace just below the lateral eyes are covered with off-white to brown setae. Behind the eye region a dark median band extends to the rear of the carapace, and behind each PLE a wide, irregular band of off-white setae extends to the rear on either side of the dark median band. The sides of the carapace are light brown, glabrous and translucent and there is no marginal band. The PME is almost equidistant between the ALE and the PLE. The opisthosoma is light coloured with a dorsal pattern of one dark brown median stripe flanked on either side by a wide stripe comprised of off-white setae, in turn flanked by a more-or-less well-defined dark brown stripe. Lateral to this stripe the dark brown markings of the dorsal opisthosoma vary in definition but may appear as four parallel, irregular lines if well-defined (Figure 64:6). The sides and ventral opisthosoma are light-brown with a covering of short, off-white setae. From below, the legs, sternum, labium, and endites are light-brown, translucent, and mostly glabrous. The legs and pedipalps are uniform in colouration, light-brown and translucent with a moderate dorsal cover of off-white scales and setae. Legs I and II are about the same length and quite glabrous. Legs III and IV are longer, legs III the longest. The epigynum (Figure 68), with sclerotized ducts visible at the medial and lateral sides of the each posterior fossa, is typical for females of the *anomalus* group.

Immatures. Emergent (second instar) juveniles resemble those of other grassland peacock spiders (Figure 69). Penultimate females (Figure 70) and penultimate males (Figure 71) resemble adult females in their colouration and scale patterns, with three prominent dark brown stripes on the dorsal opisthosoma.



Figure 69. Emergent (second instar) *Maratus neptunus*, reared from adults captured at Butterwick, NSW. **1**, Second instar with mother at left to show relative size.



Figure 70. Two penultimate female *Maratus neptunus* (1-3, 4-5) reared from adults captured at Butterwick, NSW. These look very much like adult females.



Figure 71. Five penultimate male *Maratus neptunus* (1-2, 3-5, 6-7, 8-10, 11-12) reared from adults captured at Butterwick, NSW. Scattered white setae may be present on the sides of the carapace of the penultimate male.

Courtship display (Figures 72-75). The courtship display of the male *Maratus neptunus* is relatively simple. The male elevates the fan, extends the spinnerets above it, raises and (usually) slightly flexes legs III at the femuropatellar joint, and holds the extended pedipalps, turned medially and often touching, to the front. In this fixed position the male continuously rotates the *entire body* from side to side, either by stepping around a stem (Figure 74), or by pivoting the legs in place (Figure 75).

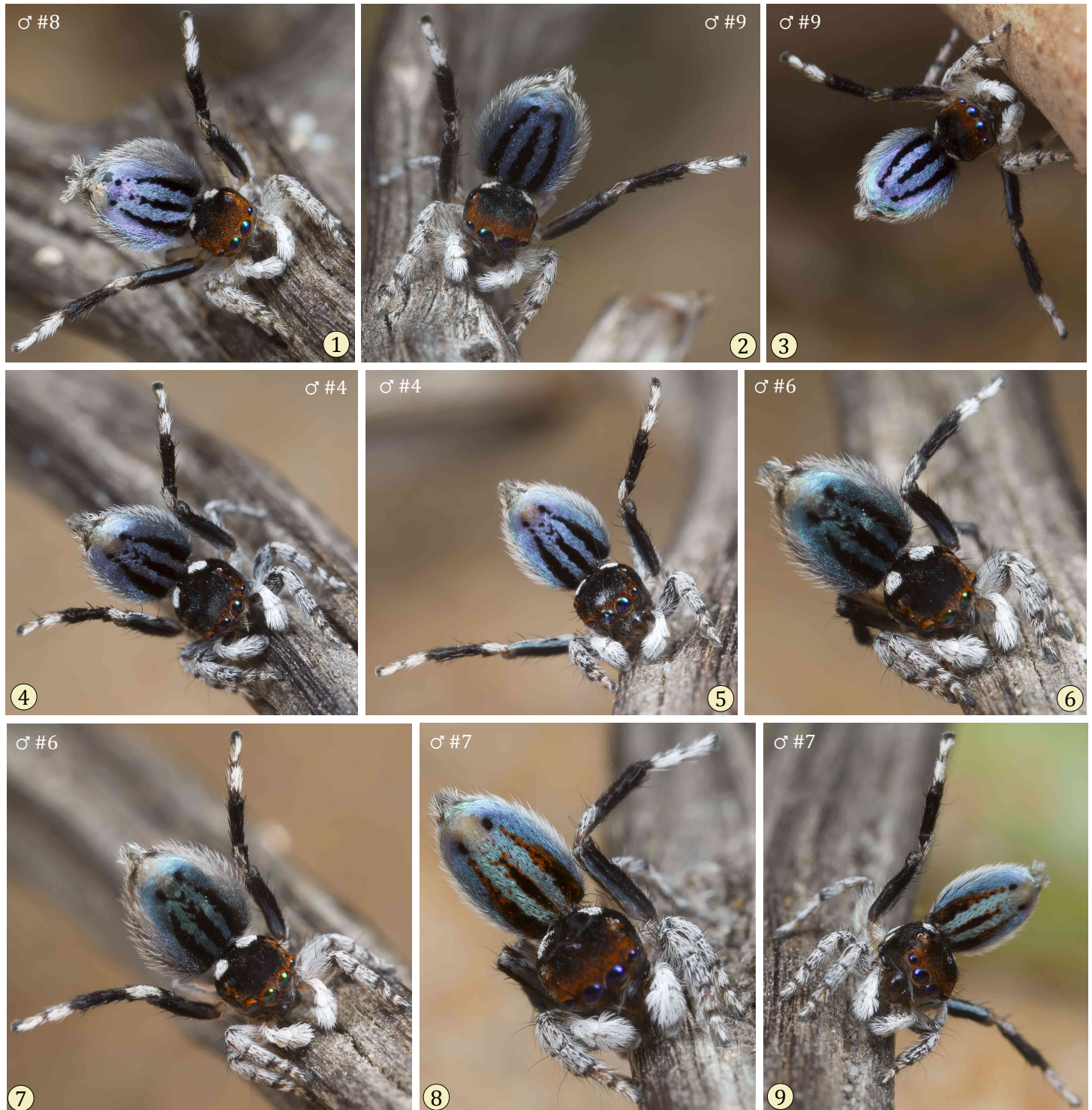


Figure 72. Display positions of five male *Maratus neptunus* (1, 2-3, 4-5, 6-7, 8-9) in front of a female.

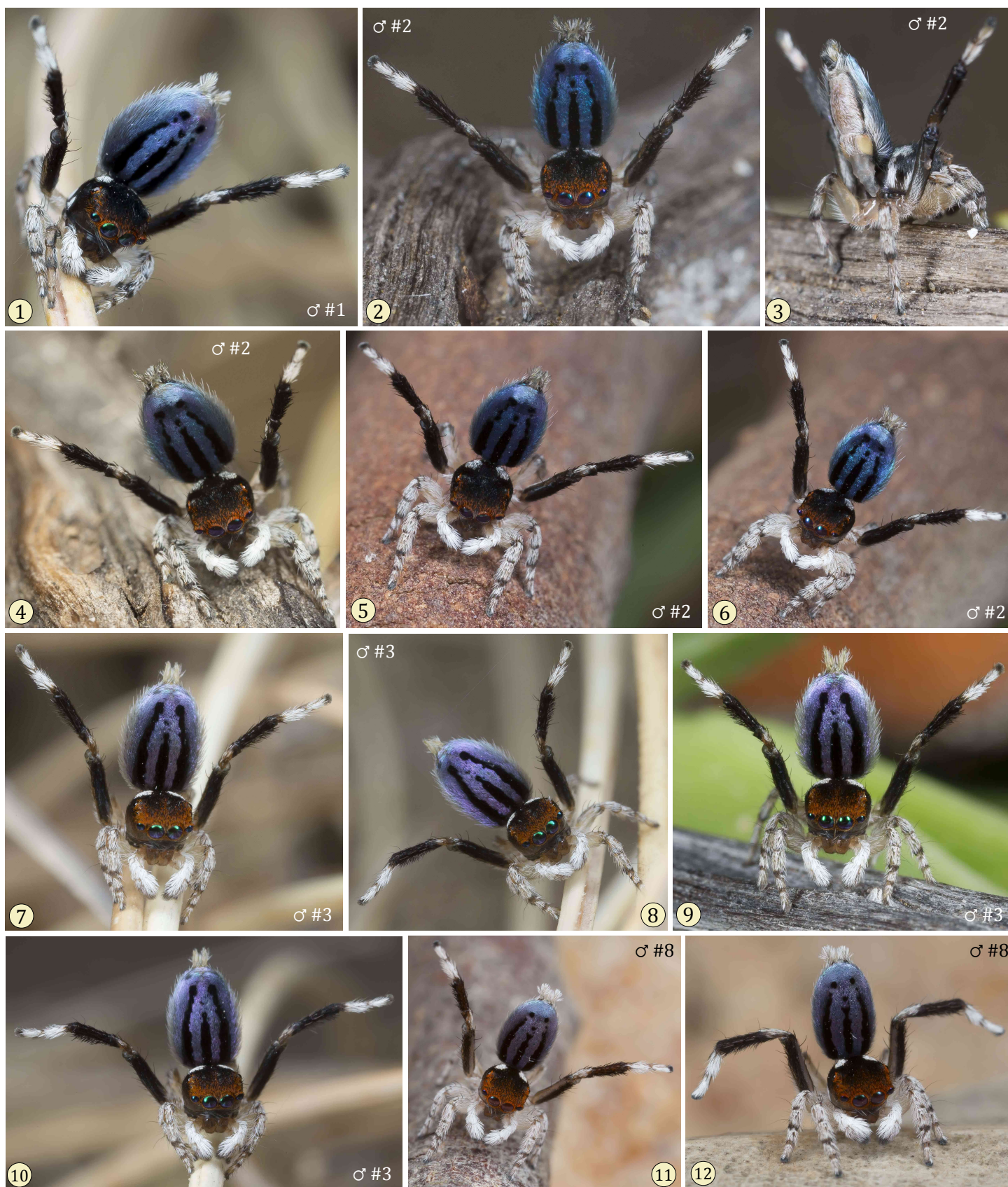


Figure 73. Display positions of four male *Maratus neptunus* (1, 2-6, 7-10, 11-12) in front of a female. 3, Posterolateral view showing the flattened opisthosoma. Note the fringes of the extended spinnerets.

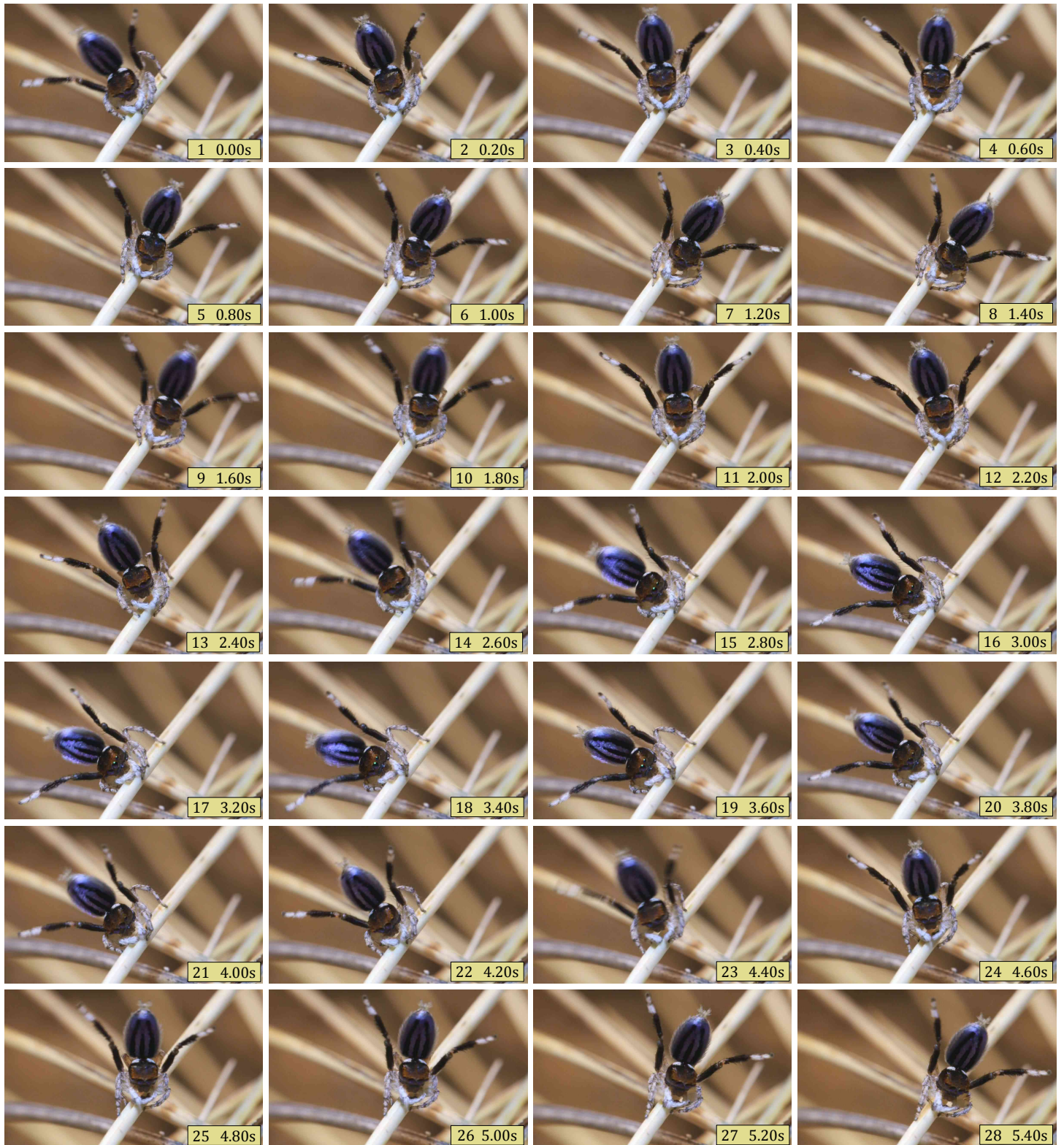


Figure 74. Sequential positions (5/s frames selected from a 25fps video) during the display of a male *Maratus neptunus*. In this sequence the male first rotated to his left (1-8), then to his right (9-18), then back to his left (19-28). Movement of the entire body was continuous as the spider stepped and pivoted around a narrow stem in front of a female.

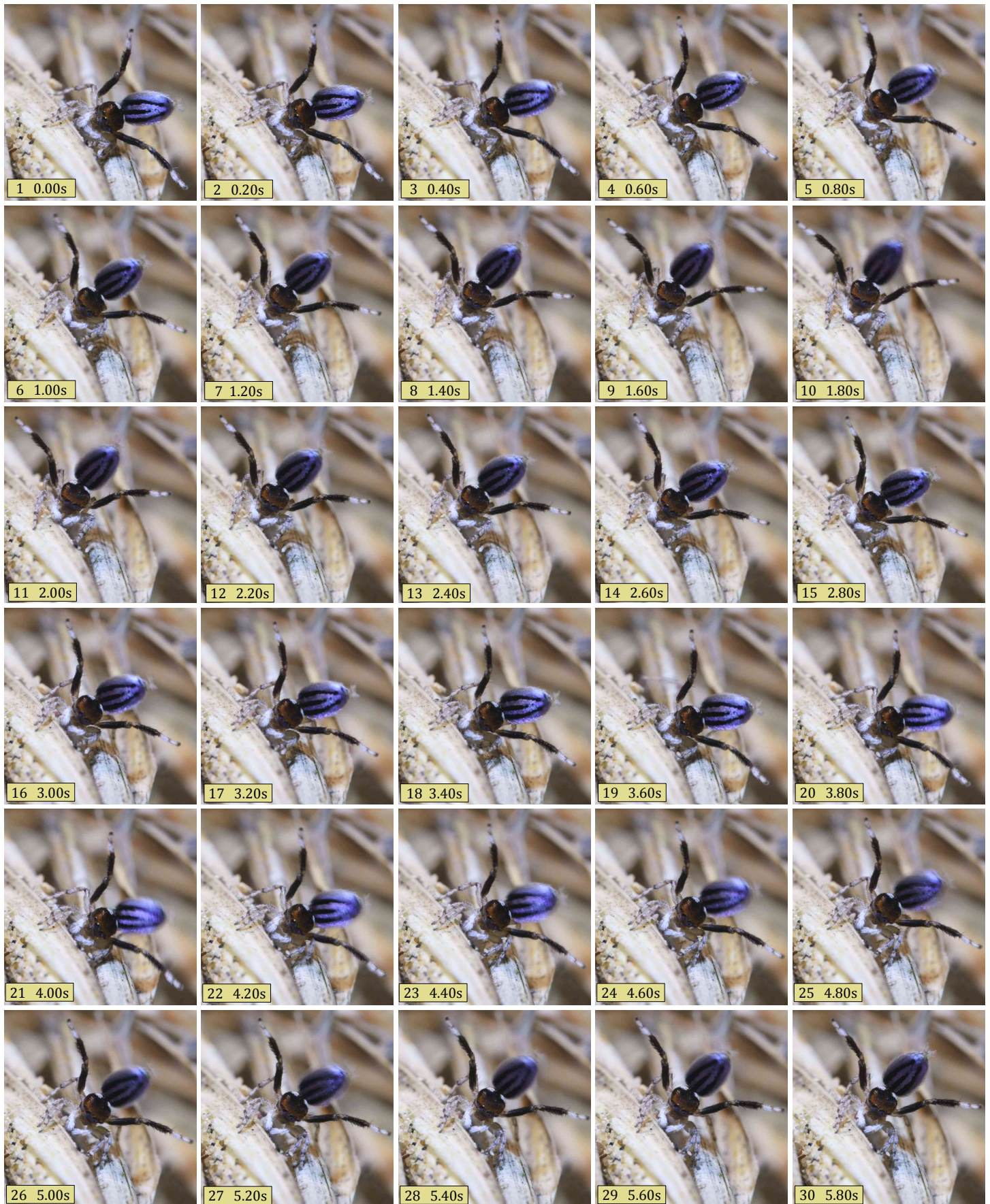


Figure 75. Sequential positions (5/s frames selected from a 25fps video) during the display of a male *Maratus neptunus*. This male first pivoted to his right (1-10), then to his left (11-20), then back to his right (22-30) with almost continuous motion.

Mating. Final approach and mating positions of *Maratus neptunus* are shown in Figure 76. When mating pumping of the pedipalp bulb occurs in synchrony with erection of the spines of all legs (Figure 77: 1-2), suggesting that cyclic pressure changes in the ventral prosoma (below the endosternite) affect fluid pressure in connected appendages simultaneously. Extension and retraction of the pretarsus including the paired claws and footpads of leg LIV of a mating female is also shown here (Figure 77: 3-12). Although part of the normal leg movement of salticids this has seldom been documented (Hill 2010).



Figure 76. Mating positions of male and female *Maratus neptunus*. 1-2, In the final approach this male touched the carapace of the female with his legs I.

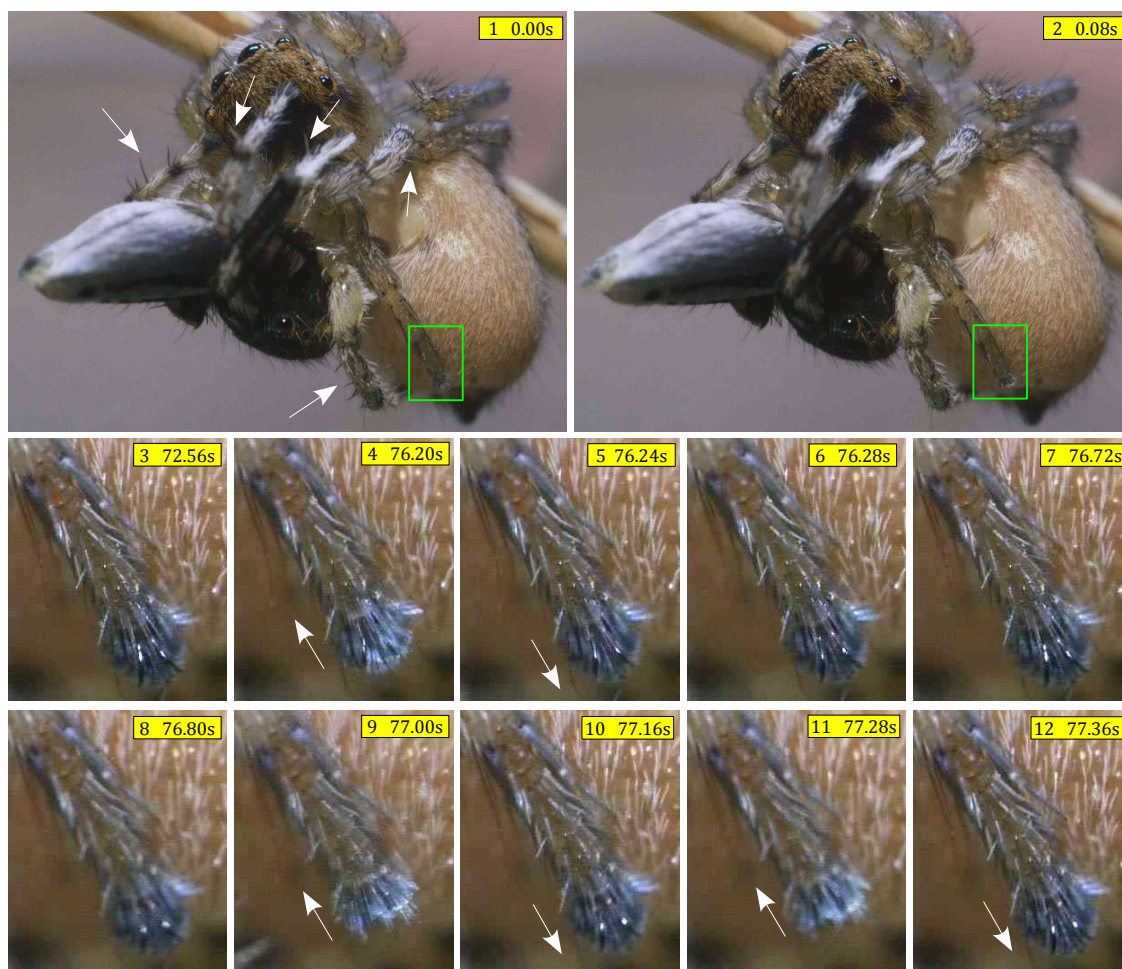


Figure 77. Movement during mating by *Maratus neptunus* (frames from a 25fps video). **1-2**, Each pumping cycle of a pedipalp is associated with extension of the spines (macrosetae) of legs I-IV of the male (1, arrows), followed by retraction of those spines (2). **3-12**, Magnified view of the tarsus and pretarsus of leg LIV of the mating female, corresponding to the inset rectangle in (1-2), from selected, sequential but not consecutive frames. Arrows indicate retraction (4, 9, 11) and extension (5, 10, 12) of the two claws and two footpads of the pretarsus.

Habitat. The habitat of *Maratus neptunus* near Butterwick and Tamworth, NSW is shown in Figure 78.



Figure 78. Grassy habitat of *M. neptunus* near Butterwick (1) and Tamworth (2), New South Wales. Photographs by Jürgen Otto (1) and Michael Doe (2).

***Saratus*, new genus**

Type species. Saratus hesperus, new species

Etymology. *Saratus* (noun, m.) is a modification of the genus name *Maratus*, selected to reflect similarities between the two genera.

Description. This is a monotypic genus. *Saratus* is small (3-4 mm) and very similar to *Maratus* species with respect to the morphology, colouration and display behaviour of both males and females. *Saratus*, like *Maratus*, have shorter legs I and II and longer legs III and IV, with legs III the longest. However, male and female genitalia of *Saratus* are distinctly different from those of *Maratus* or related genera such as *Jotus* (Otto & Hill 2016a). The embolus of the pedipalp of each *Maratus* species is comprised of a relatively large and almost complete outer ring and usually a shorter ring segment that appears beneath this near the apex (e.g. *M. neptunus*, Figure 62). The visible embolus of *Saratus* is quite small in comparison, comprised of only a short, curved spike on top of a small sclerotized process (Figure 84). Whereas the epigynum of *Maratus* species has a large and distinct fossa (window or fenestra) anterior to each large posterior spermatheca (*M. neptunus*, Figure 68), the fossa of the *Saratus* epigynum, if visible, is just below or only slightly anterior to the large posterior spermatheca (Figure 88). Because *S. hesperus* is so similar to *Maratus* in other respects, these differences in genitalia are surprising, particularly since little interspecific variation of the genitalia of *Maratus* is the norm. Comparison of DNA sequences may at some time suggest that *Saratus* should be treated as an aberrant *Maratus*, or at least a close relative of that genus. Emergent (second instar) *Saratus* have a distinctive pattern of eight black spots on the dorsal opisthosoma that disappear as they mature (Figure 90), a feature that we have not seen in any *Maratus*.

***Saratus hesperus*, new species**

Type specimens. The holotype male (♂ #1) was collected at Canberra, ACT (S35.22818°, E149.19309°, 22 OCT 2013, coll. S. Harris). Paratypes include one male (♂ #2) from Canberra, ACT (S35.22836°, E149.19315°, 21 OCT 2013, coll. S. Harris), two males (♂ #3-4) and one female (♀ #2) from the Namadgi National Park gate south of Canberra, ACT (S35.68806°, E149.08194°, 27 OCT 2013, coll. S. Harris), one female from Canberra, ACT (♀ #5) (S35.22675°, E149.19198°, 29 OCT 2013, coll. S. Harris, M. Girard), and one female (♀ #4) reared from eggs deposited by one of the other two females (♀ #2 or ♀ #5). All types will be deposited in the Australian Museum, Sydney.

Etymology. *Hesperus* (noun in apposition, m.) is the Latin name for the planet Venus as the Morning Star, corresponding to the white to light yellow spot at the centre of the dorsal opisthosoma of this species.

Diagnosis. *Saratus hesperus* is the only known representative of the genus *Saratus*. Colouration of the adult male (Figures 79-80) is distinctive, with a bright white or light yellow spot at the centre of a dark purple to dark blue or black background (Figure 82), flanked on either side by a light blue margin of the dorsal opisthosoma (fan), in turn flanked on either side by a broad black band. The carapace is black, but the legs are all light yellow. The dorsal opisthosoma of the female is brown, with lateral marginal bands of lighter brown setae outlined with darker brown setae (Figures 86-87).

Description of male (Figures 79-85). Males are 3.4-3.5 mm in length (n=4). The chelicerae, clypeus, and lower carapace, on the sides and to the rear, are black and glabrous. The carapace has no marginal band. The top of the carapace is also black, but bears a cover of scales along the anterior and lateral margins. A band of white scales extends from the top of the carapace behind each PLE to the front of the eye region,

but the centre of the eye region is black and glabrous. Below this band there is a band of dull-red scales running below the posterior eyes on either side and through the lower part of the anterior eyes in front (Figure 79: 6). The PME are closer to the PLE than to the AME. The dorsal opisthosoma has a spot comprised of white to light yellow pigmented scales at the centre of a large, nearly rectangular dark purple to dark blue or black figure (Figure 82). The margins are covered with light blue to blue-green iridescent scales. At the front is a wide band of white setae, truncated at each side of the dorsum. Below the dorsum there is a wide black band flanked by a wide white band on either side of the opisthosoma. The ventral opisthosoma has a cover of off-white setae flanked on either side by a black stripe (Figure 81). The posterior lateral spinnerets are white and can be extended during display. The other spinnerets are black.



Figure 79. Living holotype (1-6) and paratype (7-9) male *Saratus hesperus*.

Viewed from below, the coxae of the legs are black and translucent, and the sternum, labium and endites are black. Distal to the coxae the legs are uniform light-yellow in colour, and somewhat translucent. Legs I and II are shorter and about the same length, legs III and IV are longer, and legs III are the longest. Except for the cymbium, which is dark brown, each pedipalp has a dorsal cover of long, bright white setae. The tegulum and RTA of the pedipalp resemble those of *Maratus*, but the embolus appears only as a short, curved spike above a small process of sclerotized cuticle (Figure 85).



Figure 80. Living paratype male *Saratus hesperus*.

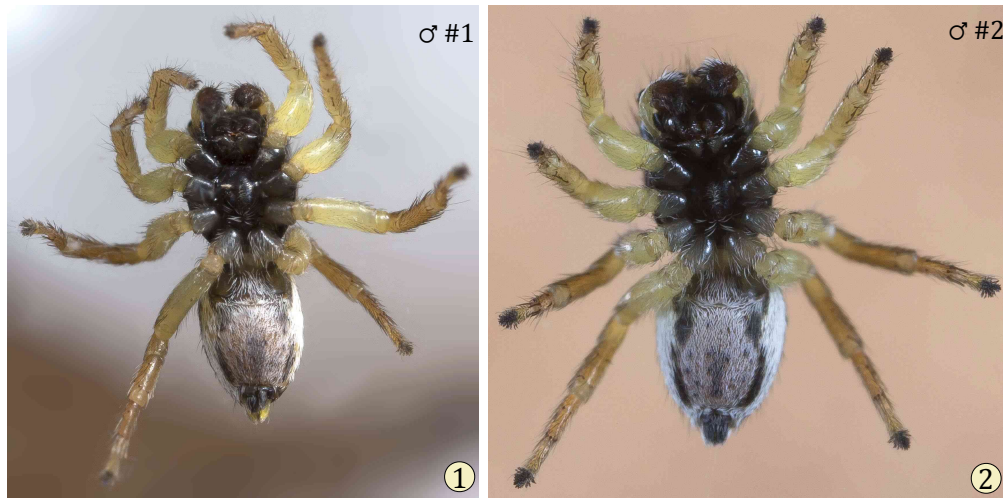


Figure 81. Ventral view of living holotype (1) and paratype (2) male *Saratus hesperus*.



Figure 82. Opisthosoma of holotype (1-3) and paratype (4) male *Saratus hesperus*. At the centre is a distinctive patch of white or light yellow pigmented scales. Surrounding this patch the saturated dark purple to dark blue or black (based on illumination) colouration of the dorsum is associated with structure of the underlying cuticle, and this has a cover of scattered, long black scales. On the lateral margins are many iridescent or transparent blue-green to blue scales, the colour of which appears to originate with the underlying cuticle. Flanking the margins of the dorsum is a wide dark grey lateral band covered with many black scales and setae, and below this the opisthosoma has a dense cover of bright white setae (3).

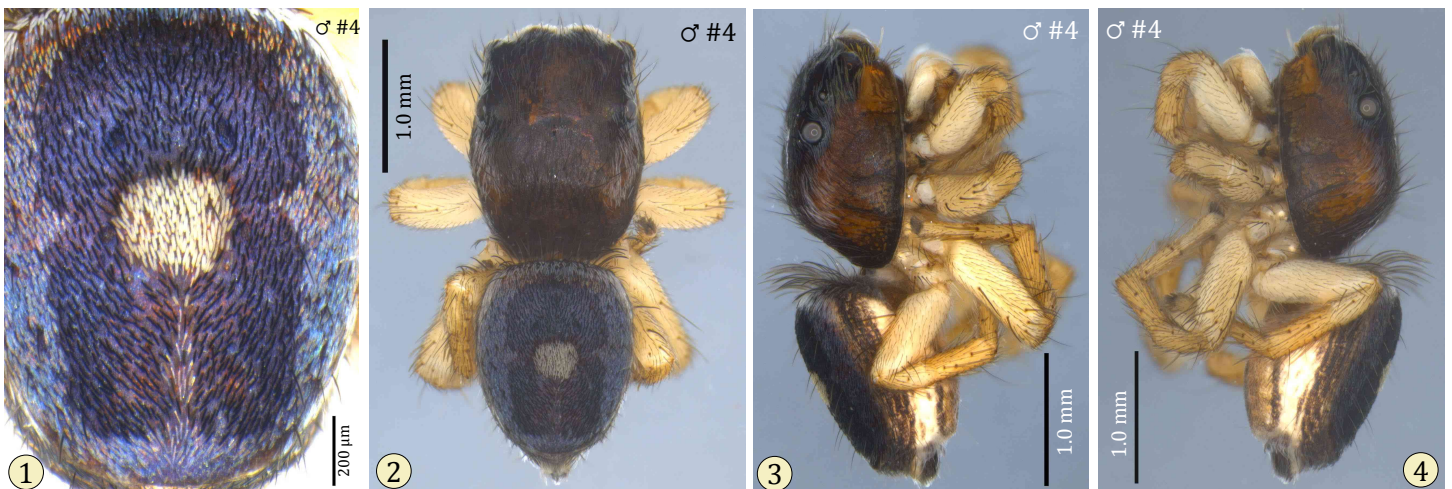


Figure 83. Paratype male *Saratus hesperus* fixed in alcohol. 1, Detail of dorsal opisthosoma.



Figure 84. Holotype (1-4 & 14) and three (5-8 & 15, 9-12 & 16, 13 & 17) paratype male *Saratus hesperus* fixed in alcohol.

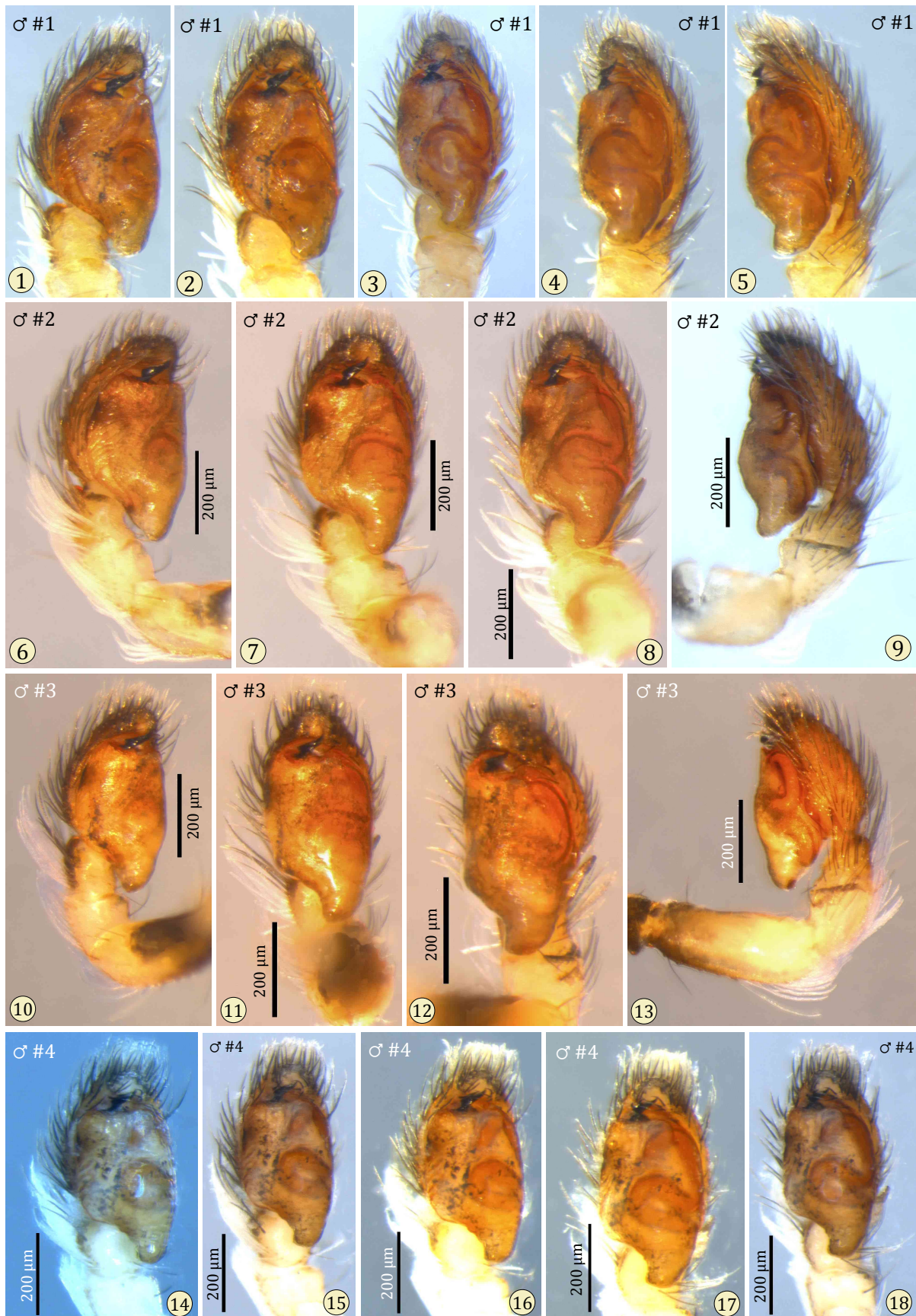


Figure 85. Medial to lateral views of the left pedipalp of holotype (1-5) and three paratype (6-9, 10-13, 14-18) male *Saratus hesperus*. Only a short, twisted, pointed apex of the embolus is visible, distal to a small arc of sclerotized cuticle.

Description of female (Figures 86-90). Females are 3.4-4.5 mm in length (n=3). They resemble female *Maratus* species and when viewed from above they have a uniform brown colouration marked only by a lighter, off-white marginal band that circles the dorsal opisthosoma.



Figure 86. Two living female *Saratus hesperus* (1-5, 6-12).



Figure 87. Three living female *Saratus hesperus* (1-5, 6-7, 8-9).

The pedipalps are mostly glabrous, light-brown, and translucent with scattered off-white setae. The chelicerae, clypeus, sides, and rear of the carapace are light brown, translucent and mostly glabrous. Longer off-white setae extend anteromedially below the front eyes. The thick lateral rims of the carapace are clearly visible and there are no marginal bands. The dorsal carapace including the eye region and the cuticle underlying the lateral eyes is dark with a relatively uniform cover of light-brown to brown or red-brown setae. This cover is dense in the eye region and sparse behind this. The PME are closer to the PLE than to the ALE.

The dorsal opisthosoma is covered with dense light to dark-brown scales or setae, flanked at the front and sides by a more-or-less distinct band of light brown scales or setae. The sides and underside of the opisthosoma are light brown with a covering of off-white scales or setae. The sides of the opisthosoma

are mottled with dark brown spots, a feature that is more evident in specimens under alcohol. Below the opisthosoma is mottled with a pair of more-or-less distinct lateral lines, all dark brown (Figure 88). The coxae, sternum, labium and endites are all light-brown and translucent. The legs are uniform in colouration, light-brown to brown and translucent with relatively few setae above and on the sides. Isolated black spots may be present under the proximal or distal ends of each femur. Legs I and II are shorter and about the same length, and legs III-IV are longer, also about the same length.

The epigynum of the *Saratus hesperus* female (Figure 89) differs from *Maratus* in that the fossae (windows or fenestrae) are poorly defined and the large posterior spermathecae lie almost directly above these (*below* in the ventral view shown here). Heavily sclerotized ducts can be seen above the anteromedial corners of the spermathecae.

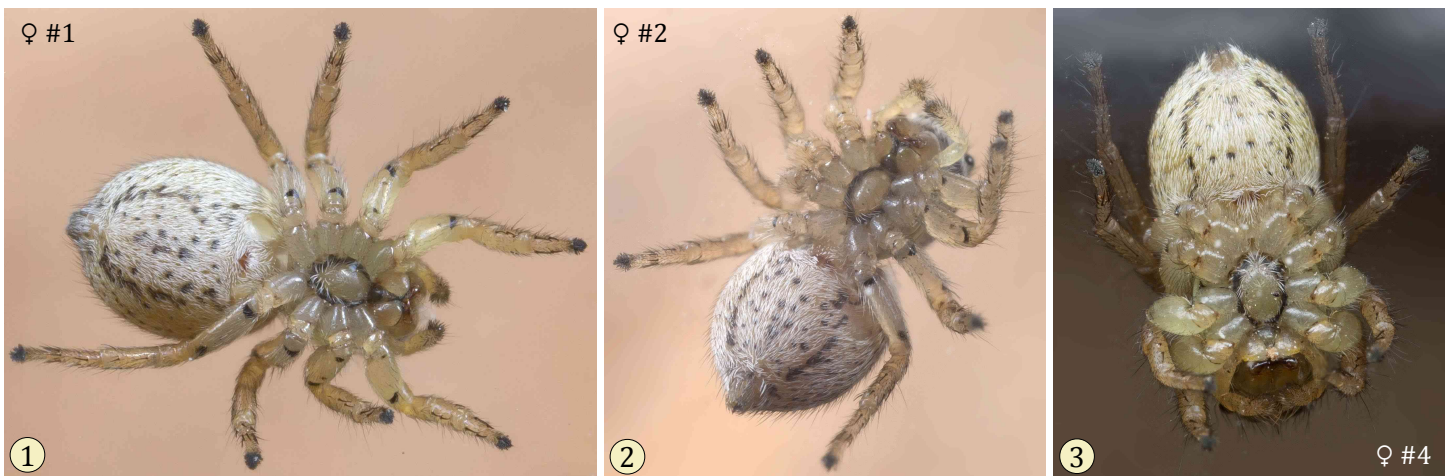


Figure 88. Ventral view of three living female *Saratus hesperus*.

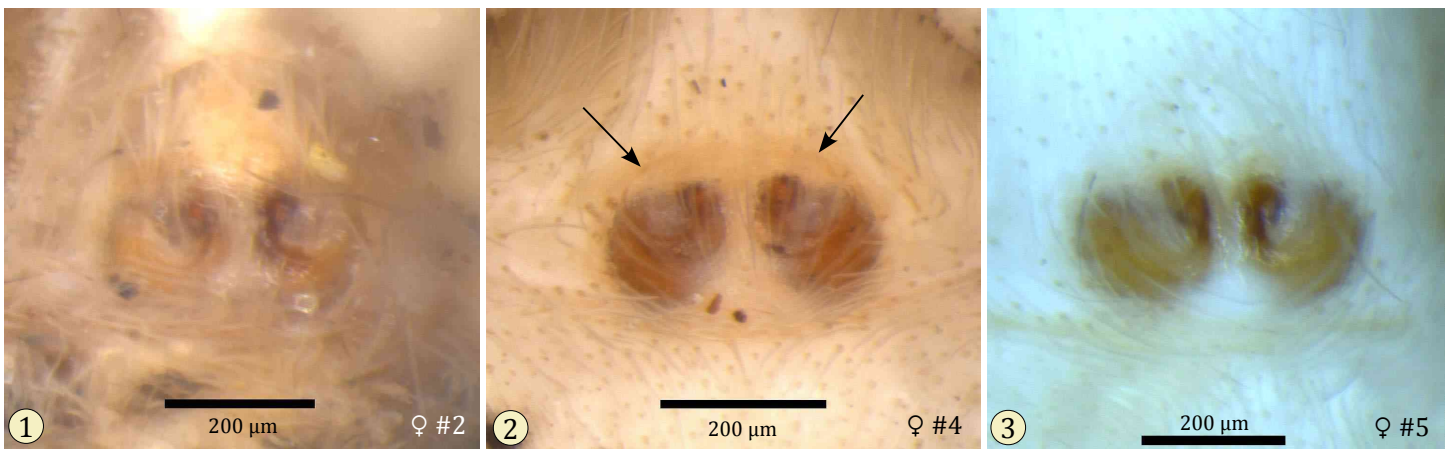


Figure 89. Ventral view of the epigynum of three female *Saratus hesperus*. **2,** If visible, the anterior margins of the relatively small fossae (arrows) are indistinct. Note the sclerotized duct at the anteromedial corner of each large posterior spermatheca.

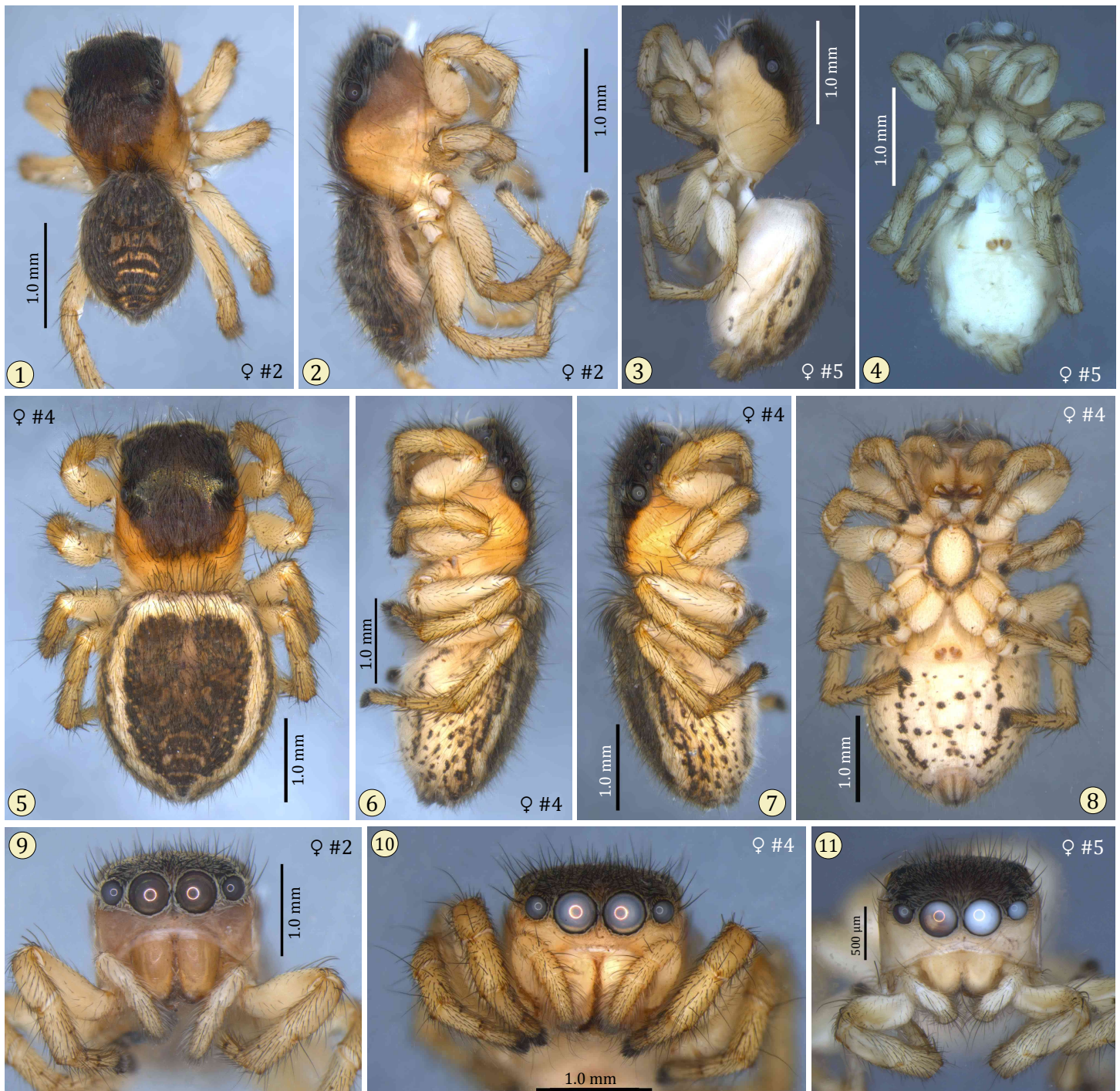


Figure 90. Three female *Saratus hesperus* fixed in alcohol (1-2 & 9, 3-4 & 11, 5-8 & 10).

Immatures. Emergent (second instar) juveniles have a distinctive set of eight black spots on the dorsal opisthosoma (Figure 91: 1-6). As they mature, these spots gradually disappear or coalesce (Figure 91: 7-18). The mother of an emergent juvenile pounced on it as if capturing prey, held it for several seconds, and then released it unharmed (Figure 91: 2). This suggests that a female can discriminate between prey and emergent conspecifics, or is able to recognise her own young.



Figure 91. Immature *Saratus hesperus*. 1-2, Emergent (second instar) juvenile with mother. 3-6, Emergent (second instar) juveniles. 7-18, Dated series of photos showing stages of development of three juveniles (7-12, 13-14, 15-18).

Courtship display (Figures 92-96). When courting a female, the male *Saratus hesperus* alternates between elevation of the fan with extended spinnerets, and sudden extension and vibration of legs III accompanied by depression of the opisthosoma (Figure 94). When the fan is elevated the male may make sudden, interrupted steps to either side, and the pedipalps are raised and held to the side to expose the chelicerae to view from the front. This is "staccato" (not smooth) movement. During the final approach to a female, the male bobs his depressed opisthosoma and rapidly vibrates the outstretched legs I (Figure 95).



Figure 92. Display positions of three different male *Saratus hesperus* (1, 2, 3-10). Note how the pedipalps are raised and held to the sides of the AME. 9, Bilateral extension of legs III.

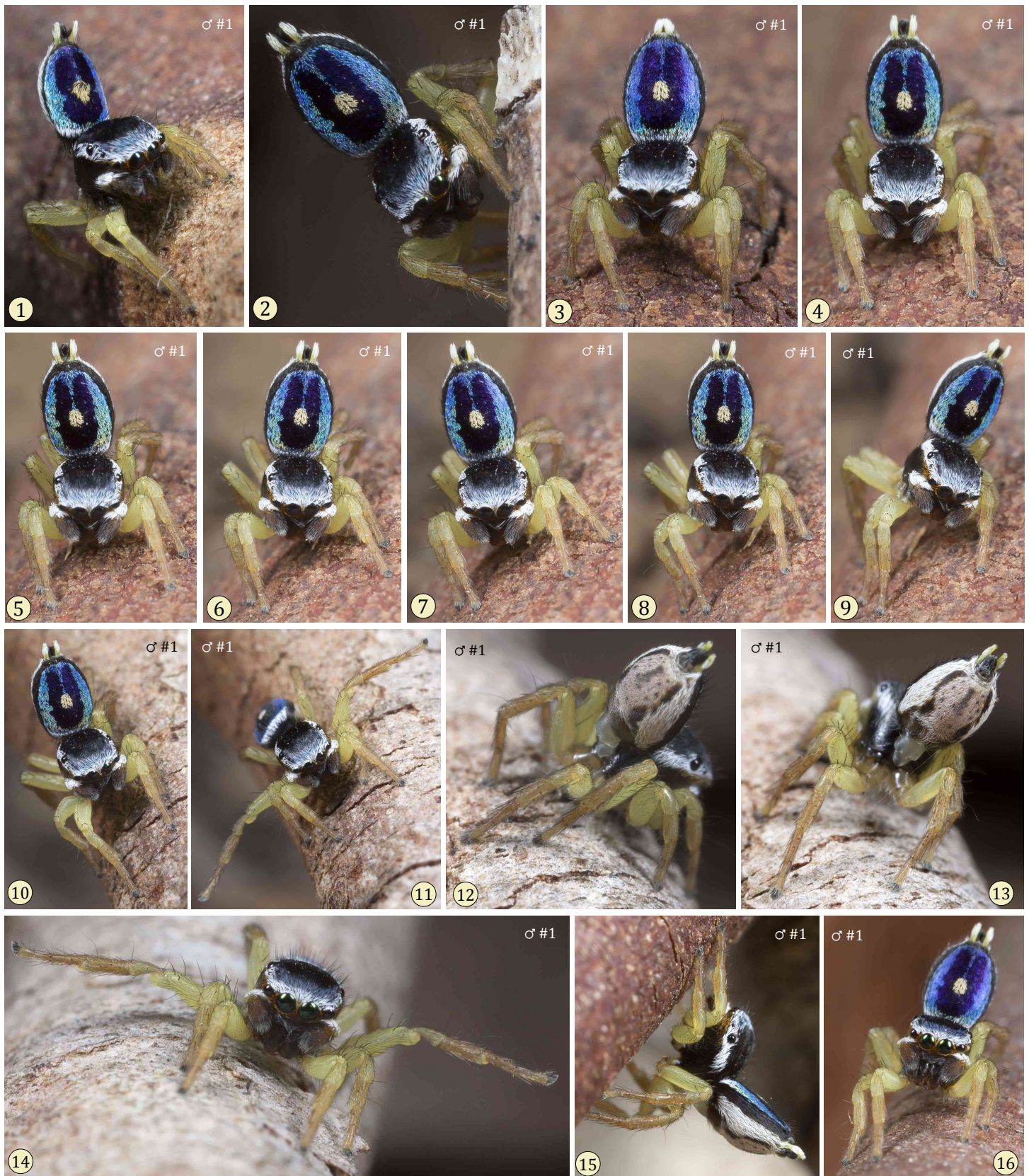


Figure 93. Display positions of a male *Saratus hesperus*. **4-9**, Sequential positions with white posterior lateral spinnerets extended. During this display the male pivots from one position to the next very quickly (staccato or interrupted movement). Note elevation and separation of the pedipalps. **11, 14**, Rapid extension and vibration of legs III with the opisthosoma depressed. **12-13**, Posterolateral and posterior views showing extension of the pedicel. **15**, Lateral view.

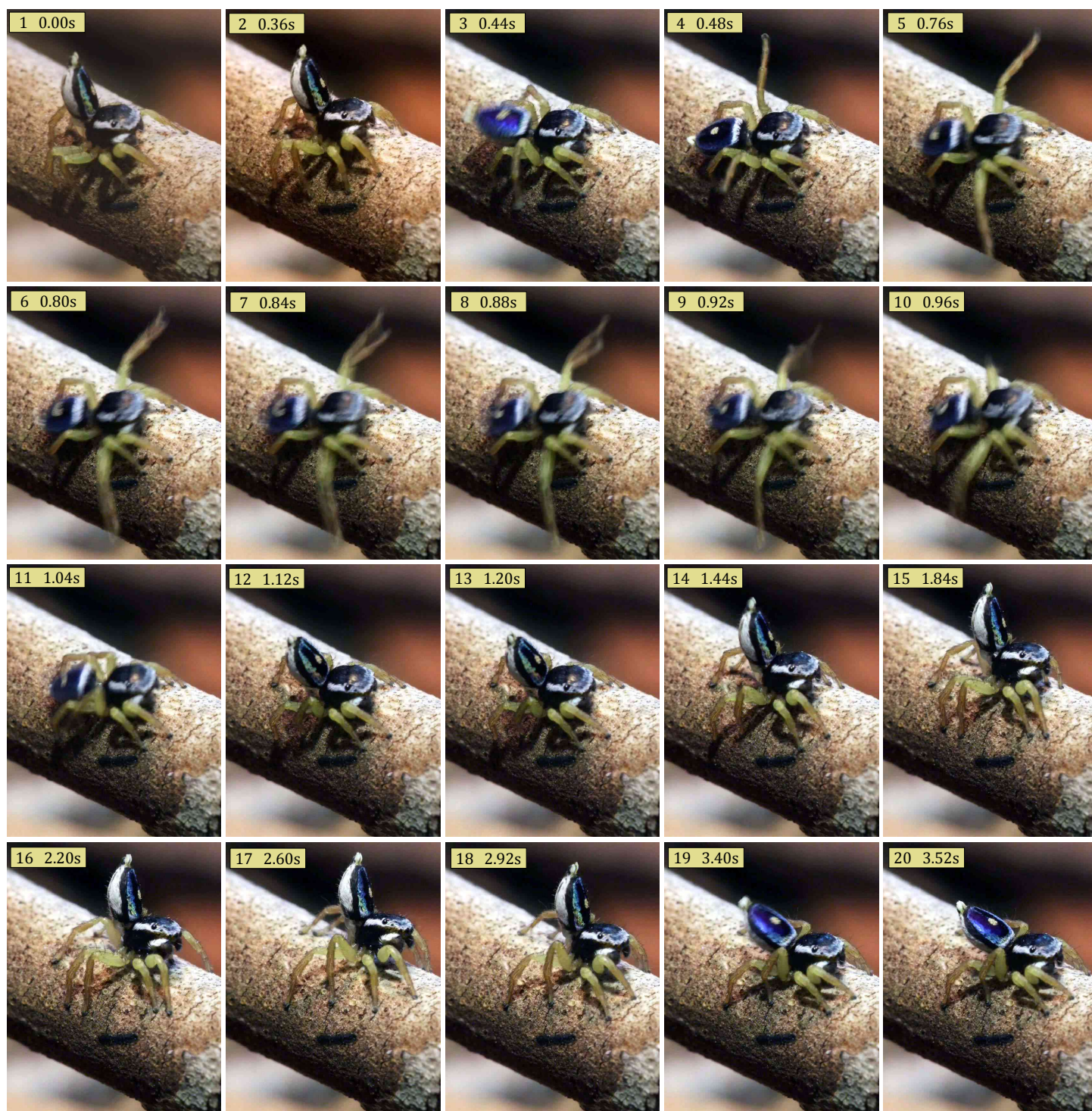


Figure 94. Sequential but not consecutive frames from a 25fps video of a male *Saratus hesperus* displaying in front of a female. **1-2**, Sudden movement or pivot to one side with the fan elevated. **3-4**, Bobbing the depressed opisthosoma, followed by extension of legs III. **5-10**, Consecutive frames (0.04s/frame) showing rapid, continuous up-and-down vibration of the extended legs III as the opisthosoma was depressed. **12-19**, Successive positions assumed during intermittent (staccato or interrupted) pivoting and stepping to one side (12-17) and then to the other side (18-19) with the fan elevated.

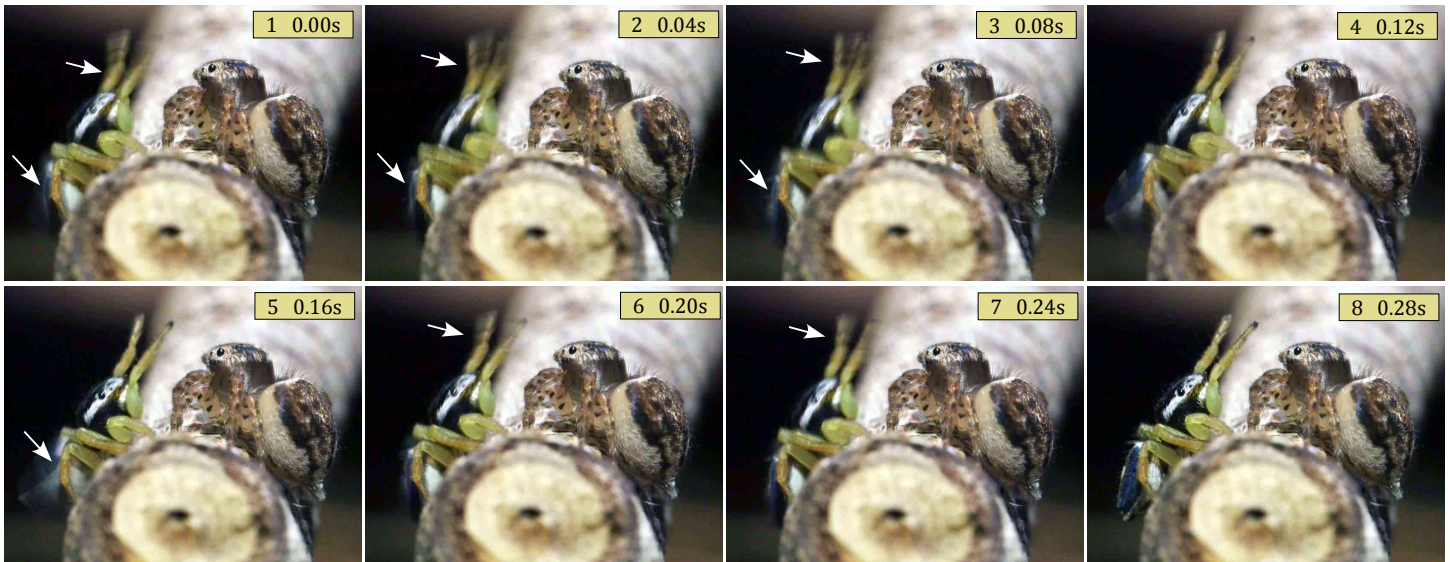


Figure 95. Consecutive video frames (25fps) showing vibration of legs I and bobbing of the depressed opisthosoma (arrows) during the final approach of a male *Saratus hesperus* to a female that may be a *Maratus volans* (O. Pickard-Cambridge 1874).

Females raise and wave their opisthosoma after turning away from a courting male (Figure 96), a display that has been observed in a number of *Maratus* species (e.g. *M. elephants*, Figure 14 in Otto & Hill 2015).



Figure 96. Sequential photographs showing "coy" or rejection behaviour of a female *Saratus hesperus* (at right), after turning away from a courting male. Movement of the opisthosoma from side to side by females in this situation has also been observed in a number of different *Maratus* species.

Distribution and habitat. In addition to the type and paratype localities in the vicinity of Canberra, ACT, *Saratus hesperus* is widely distributed, ranging from eastern Victoria through eastern New South Wales to the southern border of Queensland (Figure 97). Habitats where this species has been found vary greatly (Figure 98).

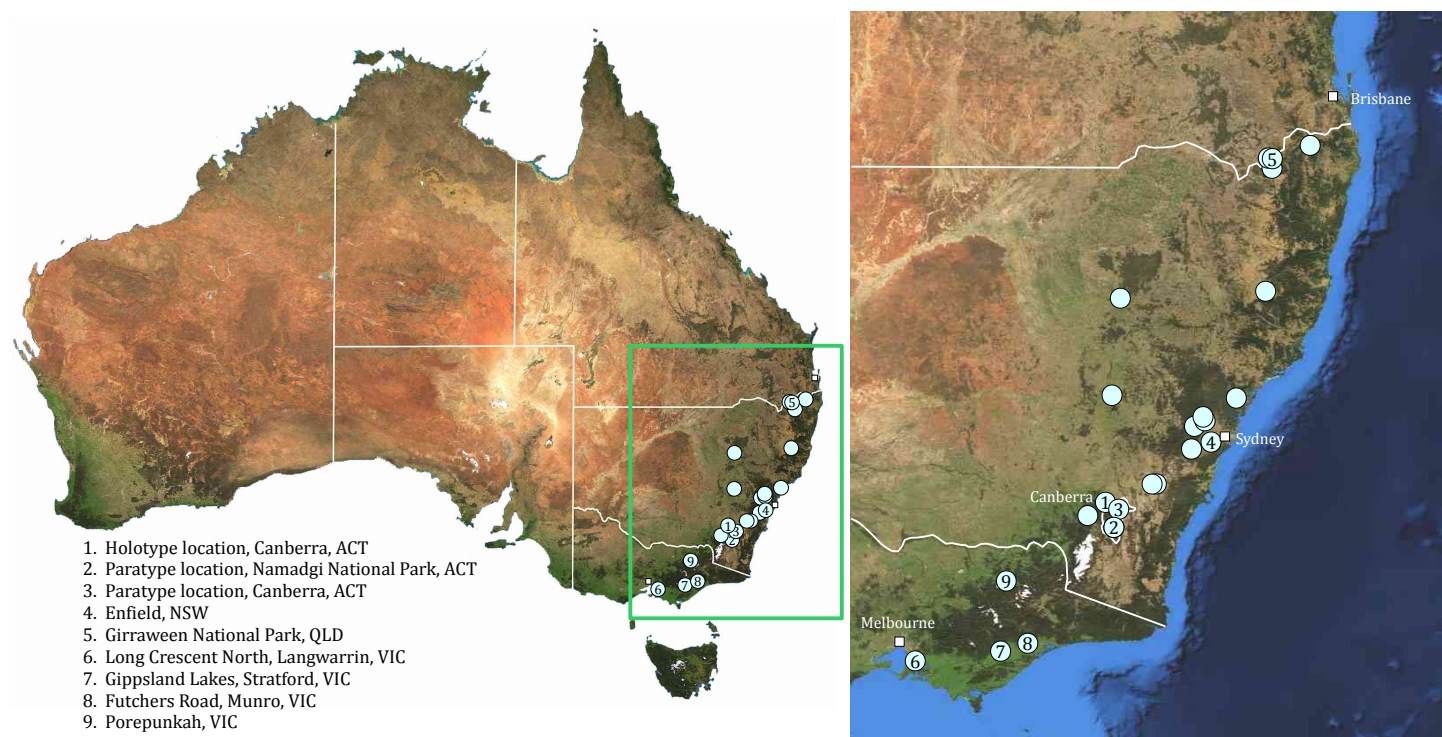


Figure 97. Distribution of *S. hesperus* in southeastern Australia. Locations (4) and (5) (See Figure 98) and unnumbered circles represent records of *Project Maratus* (Michael Doe, Michael Duncan & Adam Fletcher, pers. comm.). *S. hesperus* has also been found at four locations in Victoria (6-8, Bowerbird 2016; 9, Jacqui Wilson, pers. comm.). Maps based on NASA Visible Earth.

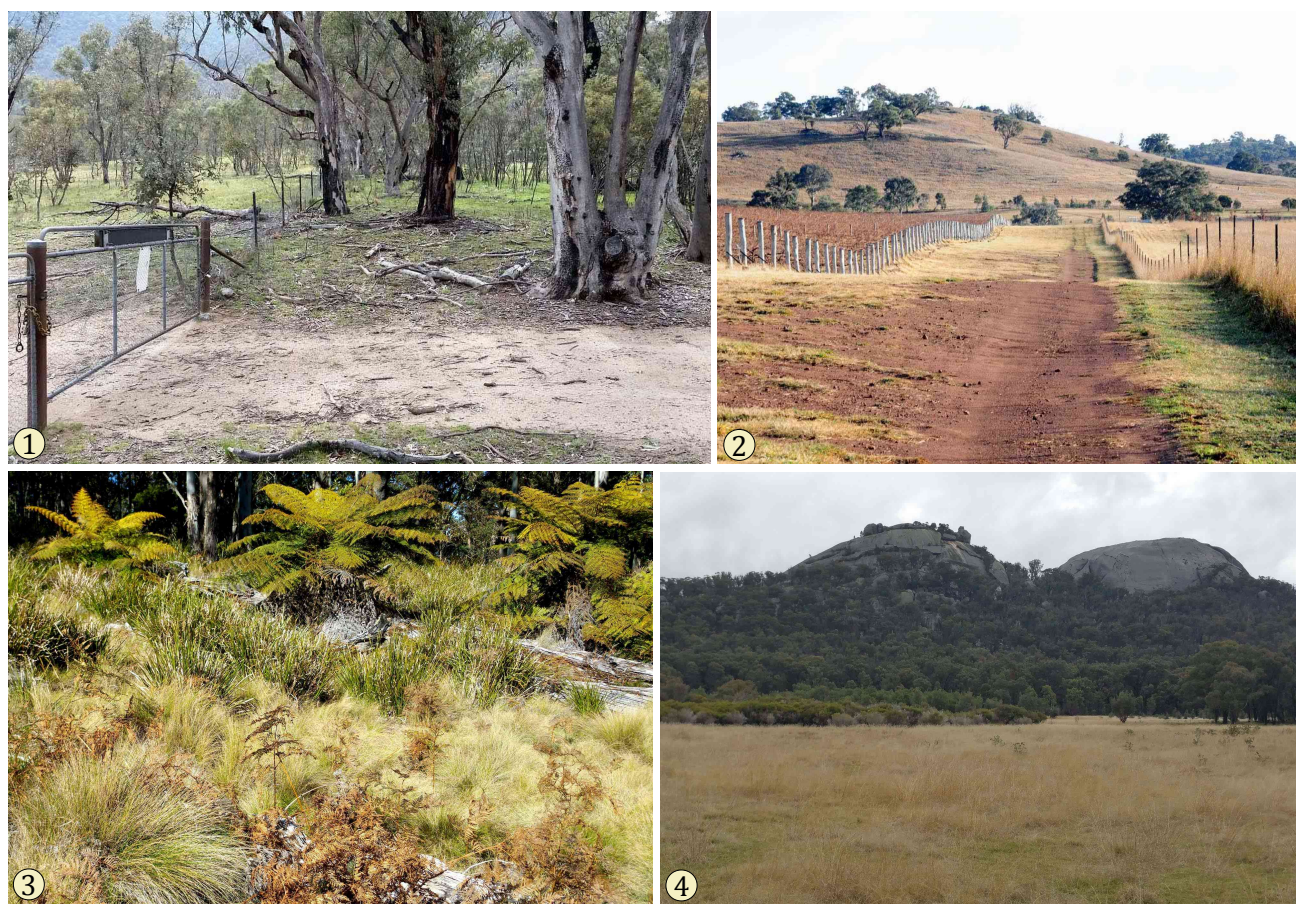


Figure 98. Four localities where *Saratus hesperus* has been found. 1, Fence near Canberra. 2, Vineyard near Canberra. 3, Enfield, NSW. 4, Girraween National Park, QLD. Photos 1-2 by Stuart Harris, 3-4 by Michael Doe.

Acknowledgments

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